

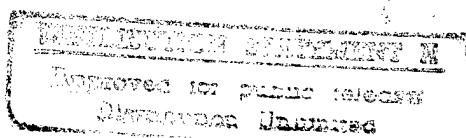
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USSR Report

AGRICULTURE



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LIVESTOCK FEED PROCUREMENT

MORE EFFECTIVE USE OF FEED RESOURCES URGED

Moscow AGITATOR in Russian No 22, Nov 85 pp 30-31

[Article by P. Didenko, chief of the Animal Husbandry Economics and Organization Administration of the USSR Ministry of Agriculture: "Feed Must Be Used More Efficiently"]

[Text] Kolkhoz and sovkhoz supplies of coarse and succulent fodder were slightly larger this winter than last. For example, the hay supply was 14 percent greater, the supply of haylage was 13 percent greater and the supply of straw and silage was 4 percent greater. This amounts to 13.2 quintals of feed units of coarse and succulent feed per head of cattle, or 1.3 quintals more than last year.

Livestock breeders organized an orderly transition to the stabling of livestock. Now the main objective of animal husbandry farm collectives and farm specialists and managers is the efficient use of feed resources and, on this basis, the augmentation of livestock productivity and a further increase in the output of meat, milk and other products of this sector.

The leading farms are making extensive use of effective methods of the efficient use of fodder. These include the improvement of feed quality and of the system of feeding standards; the development of the optimal diet; the use of biological and chemical methods to enhance the quality of feed and reduce expenditures per unit of product; the use of progressive feed preparation methods.

The sector now has 86,000 feed preparations shops and centers for cattle and pigs, 3,600 interfarm kolkhoz and sovkhoz combined fodder shops and enterprises for the processing of forage grain and various feed additives, around 1,000 shops where yeast and malt are added to concentrated feed, and more than 900 shops for the enrichment of unbalanced combined fodder at poultry factories.

Each year livestock are fed almost 80 million tons of coarse feed, including 70 million tons of minced roughage. Some is specially processed for better assimilation. Around 40-45 million tons of bulk mixed feed is prepared in granule and pellet form. Around 12 million tons of straw is used for silage.

The treatment of straw with caustic soda and liquid ammonia directly in the rick is being practiced on a broad scale.

The problem of using concentrated feed more effectively in the form of combined fodder warrants special attention. It has been established that balanced, biologically complete combination feeds can increase the productivity of livestock by 20-25 percent in comparison to simple mixtures of grain.

A new method of organizing combined fodder production was discovered in the 1970's, and kolkhoz, sovkhos and interfarm enterprises for this production began to be built. The use of local raw materials, state assistance in securing protein-vitamin-mineral additives, and technological equipment more than tripled the output of combined fodder for animal husbandry--the volume reached 75 million tons in 1984, including 20 million tons produced by agricultural enterprises. Considerable attention is being paid to the development of combined fodder production in the Ukraine, Moldavia, the Baltic republics, Krasnodar and Stavropol krais, the Mari ASSR, Rostov, Kuybyshev, Orenburg and Penza oblasts and other oblasts in the RSFSR.

The material and technical base of agricultural combined fodder enterprises has been developed in recent years. Modern completely mechanized lines have been set up for the inspection, cleaning and drying of grain, and storage elevators with highly productive transport and technological equipment are being built. This means that most of the forage grain needed for combined fodder production can be inspected and stored during the harvest season.

Lines are being installed for the addition of vitamin compounds, fat, molasses and other valuable additives to the combined fodder. Steaming and hammering are being used in the processing of vegetative raw material. This reduces expenditures of scarce high-protein components of animal origin. For example, peas have been substituted for 50 percent of the curds and fish and meat bone meal in the combined feed processed in this manner for suckling pigs and for 100 percent in the fodder for older pigs at the Balakley Combined Fodder Plant in Kharkov Oblast.

Many examples could be cited to attest to the high productivity of livestock fed with the combined fodder of interfarm, kolkhoz and sovkhos plants and shops. For example, the Put k Kommunizmu Kolkhoz in Grodnenskiy Rayon in Grodno Oblast produces its own fodder and achieves an average weight gain of 590 grams in each of the 18,000 pigs it feeds. The Rogachev Interfarm Plant in Gomel Oblast supplies combined fodder to the 12,000 pigs of the pig-breeding complex on the Kolkhoz imeni Lenin in Rogachevskiy Rayon, where the weight gain is 540 grams.

The production of mixed feed containing from 50 to 70 percent milled roughage--straw, sunflowers and other waste vegetation--has been mastered at many interfarm, kolkhoz and sovkhos enterprises. This is one effective way of reducing the amount of forage grain in the diet of ruminant livestock. The mixtures consist of, in addition to coarse fodder, 25-30 percent concentrates, grass meal, carbamide, molasses, feed phosphates, salt and other additives.

The use of these balanced mixtures in granule and pellet form produces an average daily weight gain of 800-900 grams in the final stage of the fattening of cattle.

The necessary attention is not being paid, however, to the need to increase the combined fodder output in the Kazakh SSR, the Tatar ASSR and Saratov and other oblasts.

The use of combined silage is producing good results in the sector. It is an essential element of the diet of the pigs on the Kolkhoz imeni Chernyakhovskiy in Kapsukskiy Rayon in the Lithuanian SSR. The composition of the silage here is the following: 30-40 percent potatoes, 20-50 percent carrots with tops, 15-20 percent tubers, 15-30 percent dried leguminous grass and 5-15 percent clover grass meal. A kilogram of this fodder contains 0.25 feed units, 25-30 grams of digestible protein and 30-50 milligrams of carotene.

Sows are fed 3-6 kilograms of this silage a day during the gestation period, suckling sows are fed 2-4 kilograms, young replacement sows are fed up to 4 kilograms and gilts for fattening are fed 2-3 kilograms. The kolkhoz saves more than 500 kilograms of combined fodder per ton of weight gain.

Combined silage is used extensively in the feeding of pigs on farms in the Mari ASSR.

A correctly organized fodder base in hog breeding allows for the effective use of purchased feed and locally produced feed. Their efficient use can produce cheap pork with minimal expenditures of scarce fodder grain. On many farms in Belorussia, food scraps are used to the maximum in the raising and fattening of pigs. For example, the Sovkhoz imeni Ulyanov and the Borovlyany Sovkhoz in Minskiy Rayon in Minsk Oblast process up to 80 tons of scraps a year. On the Sovkhoz imeni Ulyanov a special office collects the scraps. Productive equipment has been installed in the fodder shop of the complex for the processing of food scraps.

Food scraps account for more than 25 percent of the annual fodder supply. The use of 12,000-13,000 tons of this valuable feed each year allows the farm to conserve around 2,000 tons of concentrates or produce more than 31 additional tons of pork.

The large hog breeding farm on the Kolkhoz imeni Dzerzhinskiy in Slutskiy Rayon in Minsk Oblast annually produces 11,000 quintals of pork with the use of large quantities of green fodder in summer and conifer paste in winter.

Kolkhozes and sovkhoses in the Lithuanian SSR, Estonian SSR, Latvian SSR and Belorussian SSR have achieved the best indicators for the efficient use of feed and the augmentation of the productivity of cattle. Feed expenditures per quintal of milk in the last 3 years have not exceeded 1.1 quintal on kolkhozes in Estonia and Lithuania, 1.3 quintals in Latvia and 1.4 quintals in Belorussia, whereas the national average is 1.56 quintals.

On farms in the Turkmen SSR, Uzbek SSR, Azerbaijan SSR and Kirghiz SSR, however, the situation is much worse. Here expenditures per quintal of milk range from 2 to 2.3 quintals of feed units, and a quintal of weight gain in cattle requires more than 21 quintals in Uzbekistan, around 21 in Azerbaijan and more than 19 in Tajikistan, whereas the national average is 13.4 quintals.

The feed supply in these republics for this winter is far below the national average. For example, the annual hay procurement plan was fulfilled by 94 percent on the national level, but only by 67 percent in the Uzbek SSR and 77 percent in the Tajik SSR. The situation with regard to succulent fodder is similar.

Experience has shown that each kolkhoz and sovkhos has the potential to increase the output of animal husbandry products with the more efficient use of feed resources and the extensive introduction of the achievements of zootechnical science and the experience of leading farms. This is particularly important for farms experiencing a shortage of fodder, especially forage grain.

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LIVESTOCK

LIVESTOCK PRODUCTION, FEED EXPENDITURE DATA, 1 JAN 1985

Moscow VESTNIK STATISTIKI in Russian No 10, Oct 85 pp 79-80

[Tables]

[Text] 6. Cattle Herd According to Sex and Age Groups as of 1 January 1985
(in all categories of enterprises)

	Thousands of heads		Thousands of heads
Cattle.....	121,055	Sheep.....	142,876
including:		including:	
bull-sires.....	308	rams-sires.....	2,302
working bullocks.....	107	ewes and young ewes [up	
bulls and working		to first lambing] 1 year	
bullocks 1 year old or		old and older.....	77,641
older.....	17,065	other rams and castrated	
cows.....	43,550	rams 1 year old and	
heifers 1 year old or		older.....	22,126
older.....	25,291	young animals and lambs	
bulls and bullocks		up to 1 year old.....	40,807
under 1 year old.....	16,099		
heifers under 1		Goats.....	6,325
year old.....	17,496	including:	
other groups.....	1,139	female goats 1 year old	
		and older.....	3,816
Hogs.....	77,914	male goats 1 year old	
including:		and older.....	1,124
basic sows.....	4,352	kids up to 1 year old....	1,385
other groups of hogs			
and piglets over 2		Donkeys and mules.....	332
months old.....	60,299		
piglets up to 2		Camels.....	245
months old.....	13,263		

7. Size of Herd and Live Weight of Livestock and Poultry Sold for Slaughter

	All categories of enterprises	Including	
		Kolkhozes, sovkhoses interfarm and other agricultural production associa- tions	Of these, kolkhozes, sovkhoses and interfarm enterprises
<hr/>			
Size of herd sold for slaughter, thousands of head:			
cattle.....	38,989	30,866	30,191
hogs.....	73,898	49,382	45,417
sheep and goats.....	58,068	37,208	36,547
Live weight of livestock and poultry sold for meat purposes--total, thousands of tons.....	25,636	18,545	17,651
including:			
cattle.....	12,090	10,065	9,818
hogs.....	7,714	4,950	4,392
sheep and goats.....	1,904	1,124	1,100
poultry.....	3,445	2,216	2,162

8. Production Output of Livestock Products
(thousands of tons)

	All categories of enterprises	Including	
		Kolkhozes, sovkhoses, interfarm and other agricultural production enter- prises	Of these, kolkhozes, sovkhoses & interfarm enterprises
Meat (slaughter weight)...	16,985	12,194	11,556
including:			
beef and veal.....	7,244	6,034	5,886
pork.....	5,927	3,812	3,381
lamb and goat meat.....	866	509	498
poultry meat.....	2,686	1,730	1,688
Milk.....	97,906	74,328	72,904
Eggs, millions of.....	76,482	54,164	53,269
Wool (physical weight)....	465	352	347
Hides--total, millions of.	118	86	84
including:			
large.....	36	28	28
of these, from cattle...	35	28	27
small.....	82	58	56
of these, from cattle...	7	6	6
from sheep and goats (excluding karakul)....	67	46	45
Hides from hogs, millions of.....	38	34	33
Rabbit skins, millions of.	65	5	4
Down and feathers.....	167	112	110
Cocoons.....	52	52	52
Number of bee families....	7,882	3,803	3,427
Honey.....	193	75	67

9. Feed Expenditure for Livestock and Poultry
(in kolkhozes, sovkhoses and interfarm enterprises)

	Millions of tons
Concentrated feeds.....	115.6
Succulent feeds.....	561.8
including silage.....	242.1
Coarse feeds.....	212.1
including hay.....	67.4
Pasture feeds.....	250.7
Total feeds translated into feed units.....	332.1
Expenditure of all feeds calculated on the	
basis of:	quintals of feed units
per standard head of cattle.....	27.3
per quintal of milk.....	1.55
per quintal of weight gain (during raising):	
cattle.....	13.5
hogs.....	8.8

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AGRO-ECONOMICS AND ORGANIZATION

COST ACCOUNTING, COLLECTIVE CONTRACT IN AGRICULTURAL MANAGEMENT

Cost Accounting Defined

Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 85 pp 11-13

[Article: "Cost Accounting--A Method of Economic, Effective Management"]

[Excerpt] During the new school year the system of economic education is offering courses on cost accounting and collective contracts in kolkhozes and sovkhozes. Model syllabuses for these courses were published in Nos 33-34 of our weekly. Below we are publishing an article on the first subject.

1. An Important Condition for the Intensive Development of Agriculture

As noted at the April 1985 Plenum of the CPSU Central Committee, the development of cost accounting is one of the ways to improve the economic mechanism. Bringing cost-accounting principles to all labor collectives, to every workplace, under conditions of production intensification is acquiring an exceptional significance.

What is cost accounting? This is a method of socialist management directed at effective production management, at the unconditional fulfillment of plan goals and at the achievement of maximal production with minimal expenditures. It is called upon to expedite greater intensification, it inspires labor collectives toward creativity and it forces these collectives to improve production quality, to keep strict accounts of expenditures and to economize on both big and little.

The main principles of cost accounting for enterprises, organizations and associations consist of the following:

- return on expenditures and profitability;
- economic-operational independence;
- material interest in the best end results;

--material responsibility;

--control by means of the ruble.

Let us briefly examine the substance of these principles.

Return on Expenditures and Profitability

Return on expenditures and profitability are among the basic requirements of cost accounting. V. I. Lenin in 1922 wrote that enterprises using cost accounting have as their basis total responsibility for operating without losses (V. I. Lenin, "Works," Vol 54, p 150).

Kolkhozes and sovkhoses undergo production development primarily by means of their own income and for this reason systematic account-keeping and the comparison of income and expenditures as well as the achievement of maximal profitability are essential. Today favorable conditions have been created under which every kolkhoz, sovkhos and interfarm enterprise has the potential to operate profitably--procurement prices for basic types of products have been raised; additional measures have been taken to strengthen the material interest of agricultural workers and to retain them in kolkhozes and sovkhoses; and measures have been taken to further improve living, communal-municipal and socio-cultural conditions in the village.

Recently the CPSU Central Committee and USSR Council of Ministers passed a resolution, "On Carrying Out Economic Experiments on Improving Systems of Management and the Economic Mechanism in Individual Agroindustrial Associations of the RSFSR" (see EKONOMICHESKAYA GAZETA, No 36). The experiment is directed first and foremost at achieving the self-support of agricultural enterprises and at expanding their economic independence.

Economic-Operations Independence

Kolkhozes and sovkhoses have land at their disposal, and enterprises have production capital and labor resources. They dispose of these independently while aiming to effectively implement state plan goals; they use efficient forms of labor organization and reimbursement, confirm new and reexamine existing output norms and services rendered and enter into contractual agreements with other enterprises and farms. Moreover, economic-operational independence of kolkhozes and sovkhoses is integrally tied to the strict adherence to state plan discipline, contractual obligations, and Soviet law.

Material Interest in the Best End Result

In organizing production using their own resources, kolkhozes, sovkhoses and other state agricultural enterprises must find and utilize the possibilities of a regimen of economy and thrift. With this goal in mind, corresponding forms of material interest have been foreseen for labor collectives and for every worker as concerns the achievement of high end results of management. Economic incentive funds are being created in sovkhoses and kolkhozes in order to improve production, to provide incentives to kolkhoz farmers and sovkhos workers and to improve their cultural and everyday living conditions. Systems

of economic factors and stimuli, which provide incentives for improved product quality and for economy in material and labor resources, are being utilized.

Material Responsibility

In addition to material interest, cost accounting also assumes the material responsibility of kolkhozes and sovkhoses and their workers for the non-fulfillment of plan goals, for the violation of contractual agreements and for the inefficient use of material, labor and monetary resources.

Control by Means of the Ruble

This principle is implemented in the course of cost-accounting relations between kolkhozes, sovkhoses and state enterprises and organizations as well as within enterprises themselves. The higher-level organizations control how plans for the sale of products to the state as well as other obligations are fulfilled. Mutual control by means of the ruble is also carried out by enterprises themselves. What production expenditures are, how expedient they are, how they are reimbursed and with what products (according to both quantity and quality), and what has a significant effect on the investment of resources and labor--these are the basic parameters for their production activities which are under constant control. Financial organs and banks control the correctness of use by enterprises of both their own resources as well as loans.

Cost accounting on the scale of the entire agricultural enterprise is becoming more and more efficient under conditions of a clear organization of intraorganizational cost accounting, which encompasses all production subdivisions of kolkhozes and sovkhoses.

The organization of kolkhoz-sovkhoz production on the basis of intraorganizational cost accounting is secured by the Constitution and Basic Law of the USSR. Of course, there are essential differences in management conditions among sovkhoses (state agricultural enterprises), kolkhozes and other cooperative organizations as well as interfarm enterprises.

The tasks, rights and obligations of state enterprises have been established by the Resolution on the Socialist State Production Enterprise.

The activity of the kolkhoz is regulated by the Model Instructions; that of interfarm enterprises--by special-purpose resolutions.

But the basic principles and methods of management are uniform for all of our enterprises.

2. The Essence of Intraorganizational Cost Accounting

Intraorganization cost accounting expresses the relationship of the collective of the cost-accounting subdivision with the enterprise, with other subdivisions and with individual workers. In contrast to cost accounting by the kolkhoz or sovkhos, intraorganizational cost accounting does not propose to give the subdivision the rights of a legal body or the right to enter into

economic relations with other enterprises and organizations or to have an independent balance and current account in Gosbank. The subdivision operates as an integral parts of a single enterprise which employs the basic principles of cost accounting.

The Resolution on Introducing Intraorganizational Cost Accounting, confirmed by USSR Minсельхоз [Ministry of Agriculture] in June 1985, establishes the major requirements of intraorganizational cost accounting:

- the allocation to production subdivisions, in accordance with the goals of their operations, of labor and material resources and fixed production capital for the purpose of fulfilling the plan and of increasing production output (jobs and services);

- the evaluation of the fulfillment of established plans, the comparison of actual normative expenditures and a determination of the savings or overconsumption of resources for a certain group of indicators on cost-accounting operations;

- the establishment of material and moral interest of subdivisions as a whole and of individual workers in the efficient use of production resources, in fulfilling plans and obligations to other structural subdivisions, as well as the establishment of material and administrative responsibility for work results within the limits of those indicators or expenditures which they can have a direct influence on.

The organization and improvement of intraorganizational cost accounting must be accompanied by a strengthening of the material-technical base of subdivisions and by other organizational-economic measures--by improving production management; by intraenterprise specialization; by the selection and distribution of trained cadres for key production sectors; by the introduction of progressive technologies and methods for planning, accounting, account-keeping and economic analysis, and of norms for labor, material and monetary expenditures for production output or for jobs and services; by improving the forms of material rewards for labor and for the interrelations between intraenterprise subdivisions; and by the education of economic thought in workers.

The following are making a transition to intraorganizational cost accounting:

- links, brigades, farms, sections, shops, departments and livestock-raising complexes involved in the production of agricultural products;

- specialized permanent and temporary subdivisions created to carry out different types of work (for example, procurement of organic fertilizers, operation of reclamation systems, feed preparation and other processes);

- repair-mechanics shops and transportation, energy, water management and building subdivisions that provide services to the basic branches;

- industrial subsidiary works and trades;

--the housing-municipal industry and public nutrition and socio-cultural facilities in enterprises;

--agricultural, zootechnological, veterinary, engineering and economic planning, bookkeeping and other functional services.

As a rule, a cost-accounting subdivision is assigned a selection of agricultural crops or fields of complete crop rotations, herds of cattle and poultry, agricultural machinery and other means of labor. At the disposal of these cost-accounting subdivisions are the resources necessary for cultivating and harvesting agricultural crops, for producing livestock and other products or for carrying out a certain volume of jobs and services.

Structural subdivisions of the kolkhoz or sovkhov which have been transferred to intraorganizational cost accounting implement the production process independently and bear the responsibility for carrying out a cost-accounting assignment, socialist obligations on volume, production schedule and production quality (jobs and services), and the efficient use and preservation of agricultural lands, labor and material resources and fixed capital assigned to them.

As practical experience shows, the most effective cost-accounting subdivisions are those which operate under collective contracts. They achieve the highest labor productivity by means of the best use of labor and material resources, of combining professions, of combining efficient work and rest regimens and of strengthening the interest and responsibility of all members of the collective as concerns the end results.

Total Number of Brigades and Links, Including Those Operating According to Collective Contracts (thousands)

Year	Number of brigades and links in farming:	Of these, the number operating according to collective contracts:
1982	335.0	39.4
1983	331.6	75.2
1984	294.6	144.7

Year	Number of brigades and links in livestock raising:	Of these, the number operating according to collective contracts:
1982	289.4	18.2
1983	312.8	46.2
1984	407.0	151.4

3. Work According to Contract Conditions

Collective contracts are an integral part of intraorganizational cost accounting. Speaking at the All-Union Economic Conference on Problems of the Agroindustrial Complex in March 1984, M. S. Gorbachev said, "The CPSU Central Committee attaches great significance to the introduction of collective contracts. This is not a short-term campaign. We are speaking about the radical restructuring of the entire organization and reimbursement of labor and about a growth in the responsibility of workers for the achievement of high end results. Party committees, trade union and Komsomol organizations and councils of agroindustrial associations must strengthen organizational and political work related to disseminating collective contracts. Other progressive forms of organizing production and wages must also be disseminated more widely."

The basic document determining the interrelations between contractual subdivisions and an enterprise's management is the contract. It specifies the mutual obligations of parties--the labor collective of the contractual subdivision receives an assignment to produce a certain quantity of products, and the management of the enterprise obliges itself to supply the subdivision on schedule with the necessary resources and conditions for the successful solution of this task and to pay for the products that are produced according to predetermined conditions and estimates.

As practice shows, in brigades, links and other subdivisions operating according to collective contracts there is a successful coordination of the personal interests of workers and the interests of the collective as a whole with the general goals of the enterprise as concerns increasing production output. Workers and kolkhoz farmers are recruited through their labor collectives to manage farm affairs; they participate in discussing production questions and themselves determine the order of labor organization within their own subdivision. As a rule, in such collectives labor discipline becomes strengthened, mutual demandingness and responsibility increase and the attitude toward work improves. In cost-accounting subdivisions expenditures are kept track of better and feeds, fuel and other materials are used economically.

The advantages and effectiveness of collective contracts in agriculture are most fully manifested under conditions of the optimal number of brigades, links and detachments and under condition in which a selection of crops or crop rotations, agricultural technology and a herd of cattle and poultry are secured to these for the long-term for the purpose of maximal employment of workers in the course of the year.

Contractual subdivisions must be assigned economically-based cost-accounting tasks with a consideration of the achieved level of production and of progressive norms for the consumption of raw materials, materiel, feed, fertilizers and other resources.

At zonal conferences on the introduction of collective contracts held in Leningrad and Tomsk, an analysis was made of the accumulated work experience of intraenterprise subdivisions under conditions of collective contracts in

livestock raising. As noted at these conferences, 90 percent of sovkhos farms in Leningrad Oblast have introduced intraorganizational cost accounting and labor collectives have begun operating under conditions of collective contracts. In Detskoselskoye Production Association, Sovkhoz imeni Telman, Gatchinskiy Sovkhoz, Ruchi Sovkhoz and others, with the experiences of which the conference participants became acquainted, the labor productivity of livestock farmers who made a transition to collective contracts increased by 25-30 percent.

The introduction of collective contracts requires laborious, intensive and goal-oriented work first and foremost by party organizations, agroindustrial associations and kolkhoz and sovkhos directors and specialists. In Tomsk Oblast questions of improving the organization and reimbursement of labor were also examined on numerous occasions in plenary sessions of the bureaus of the oblast party committee and rayon party committees. Here a plan of organizational measures has been confirmed and is in effect, and base enterprises have been determined in every rayon to develop, in practice, new forms of labor organization and material stimulation. Great significance is attached to the preparation of cadres, to the development of economic thought in them, and to equipping them with a knowledge of the basic principles of cost accounting and collective contracts.

In the oblast a number of zonal seminars have been carried out for directors and specialists of kolkhozes and sovkhos. The experience of the best subdivisions operating according to collective contracts is being generalized and widely elucidated in the press and on radio and television; posters, brochures and booklets are being published.

For this reason, it is no accident that in the oblast over 45 percent of livestock farmers, who provided services for almost two-thirds of the cattle and poultry, are working according to collective contracts within livestock raising.

In Smolenskiy Rayon of Altay Kray skilful use is being made of the advantages of collective contracts and cost accounting principles. All sovkhos subdivisions here have made a transition to cost accounting. Contract collectives provide services for 94 percent of cows and 46 percent of hogs. The extensive use of progressive forms of labor organization has enabled the rayon to increase the average annual production of milk by 10 percent as compared with the 10th Five-Year Plan, of meat--by 15 percent, and to fulfill the plan for the procurement of all types of livestock products. Labor productivity in agriculture increased by 25 percent.

Belgorod, Chelyabinsk and Orenburg oblasts and Stavropol Kray were mentioned at the zonal conference as being among the krays, oblasts and autonomous republics of the RSFSR where extensive work is being carried out to introduce cost accounting and collective contracts.

Murakhovskiy on Collective Contract

Moscow EKONOMICHESKAYA GAZETA in Russian No 8, Feb 85 pp 11-13

[Article by V. S. Murakhovskiy, first secretary of the Stavropol Kray CPSU Committee: "Collective Contracts in the Village"]

[Excerpt] A letter from the participants in the All-Union Economic Conference on Problems of the Agroindustrial Complex to the Central Committee of the Communist Party of the Soviet Union and to the General Secretary of the CPSU Central Committee, Comrade K. U. Chernenko, stated: "We will do all that is necessary to introduce cost accounting, progressive forms of organizing and reimbursing labor and especially collective contracts, in order to strengthen the regimen of economy and of the steadfast growth in labor productivity and of decreased production costs."

Questions of introducing contracts were widely discussed at the zonal conferences that took place in Leningrad and Tomsk. Among the krays, oblasts and autonomous republics of the Russian Federation where extensive work is being done to introduce cost accounting and progressive forms of organizing and reimbursing labor is Stavropol Kray. Here positive work experience has been amassed under conditions of collective contracts in both agriculture and livestock raising.

The article below discusses the experience of the leading enterprises in the kray as regards strengthening cost accounting.

By realizing the favorable economic and social potential foreseen by the decisions of the May 1982 Plenum of the CPSU Central Committee, the kray's kolkhozes and sovkhozes were able to noticeably increase agricultural production output and to strengthen the economy.

During the past 4 years the average annual volume of gross agricultural production increased by 16.5 percent, which corresponds to the targets of the five-year plan. Plans for the procurement of grain, sugar beets, potatoes, melons and all types of livestock products have been successfully fulfilled. The average annual sale of grain increased by 29 percent, of livestock and poultry--by 21, and of milk, eggs and wool--by 11-14 percent.

This is the result, first and foremost, of the selfless labor of field and farm workers, of considerable support and help from the party's central committee and government and of the purposeful work of the kray party organization to mobilize village labor collectives to fulfill the Food Program.

In dealing with the tasks set before the kray's agricultural workers, councils of agroindustrial associations under the leadership of party committees are

placing primary emphasis on economic work methods, on improving labor organization and production management and on the extensive introduction of cost accounting and collective contracts.

We long ago focused attention on the fact that all else being equal, kolkhozes and sovkhozes develop at a rapid and stable pace if cost accounting has been the basic economic form for a long period of time and if people know how to and love to, yes love to, compute, for this is directly related to wages and to the moral and material evaluation of labor.

Nevertheless, our numerous attempts to disseminate their experience everywhere have not met with support from the directors and specialists of rayons, kolkhozes and sovkhozes. These people pointed to the lack of planning objectivity, to the fact that production losses for which they are not at fault are not covered by income, and to the fact that cost accounting is devoid of a material foundation. An analysis that was made confirmed the justification of these complaints.

Equalizing Economic Potential

According to the instructions of the kray CPSU committee, scientists and specialists have developed a methodology for evaluating land and resources and for translating them into a single resource indicator--the comparable hectare--for all of the kray's enterprises. Thus, the potential of each kolkhoz, sovkhoz and rayon was established in terms of a hectare of comparable arable land. At the same time there was an introduction of coefficients for the transition of all production to a single output indicator in terms of feed units, and actual output in every rayon and enterprise was calculated. It turned out that the difference in production output per comparable hectare reached a factor of 2, and by enterprises--a factor of 3 and more.

In 1980 a methodology of equal-intensity planning was developed and a goal was established--in the course of the next 10 years to equalize the load born by enterprises and rayons. For example, the plan for the current five-year plan indicates a growth pace of 8-9 percent in the enterprises of Apanasenkovskiy Rayon and of 40-42 percent in Novoselitskiy Rayon.

Despite this type of difference in pace, extensive educational work, the training of cadres in new methods and widespread coordination in planning resulted in the fact that very few were offended, at least many fewer than in previous years. The pace of development of lagging rayons and enterprises grew sharply. During the past 4 years as compared to the 10th Five-Year Plan that same Novoselitskiy Rayon increased its average annual sales of grain by 57 percent, of fruit--by 42 percent, of meat--by 49 percent, of wool--by 26 percent and of milk--by 30 percent, and curtailed lags behind leading rayons by a factor of over 2. We were able to equalize production output per comparable hectare in the same proportions in the kray as a whole during this time.

The second main direction in introducing cost accounting was the equalization of economic potential.

Practical experience has shown that despite the high level of interrayon and interfarm specialization, outlays for the production of a particular product fluctuate by a factor of 1.5-1.7 among the kray's enterprises for objective reasons related to natural-climatic conditions and to the location of the enterprise. As a result, people made a great effort and contributed a considerable amount of labor, but cost accounting remained a formality.

We implemented a thorough price differentiation after separating the kray's rayons into three price zones and enterprises into seven price subgroups. As a result, the differences in objective potential for profitable management of the enterprise were brought down to a minimum. Demand for production effectiveness became more objective.

Finally we come to the third point. The experience of our best enterprises--Kazminskiy Kolkhoz of Kochubeyevskiy Rayon, Put K Kommunizmu Kolkhoz of Stepnovskiy Rayon and Kommunisticheskiy Mayak and Orlovskiy kolkhozes of Kirovskiy Rayon as well as a number of others--has shown that traditional forms of labor organization--complex brigades and small crop rotations--have become a serious hindrance to the introduction of cost accounting. These traditional forms have not allowed us to form primary cost-accounting subdivisions having sufficient cost-accounting independence and capable of effectively utilizing modern techniques and technology.

Thus we arrived at the necessity to accelerate intrafarm specialization (and consequently, interfarm), the branch management structure, expanded crop rotations and the creation in every enterprise of specialized production subdivisions in farming and livestock raising according to product types.

At the present time, two-thirds of our kolkhozes and sovkhoses have introduced the branch management structure and expanded crop rotations. Now farming, feed production and livestock raising have been separated into cost-accounting branches. Relations among them are regulated by intraorganizational accounting prices which take into account the quantity and quality of products produced. The profits of the branch become the indicator of results.

Within the branches, let us say, of livestock raising we find specialized subdivisions, the farms and collectives of which have also made the transition to cost accounting. The basic organizational form for introducing cost accounting in primary subdivisions is the collective contract. Specialists also belong to such collectives.

Brigades and detachments conclude contracts with enterprise as regards production, receive expenditure limits and know precisely what they will receive for each hectare of production, for each percentage of improvements in quality and for each ruble of savings. They themselves carry out daily account-keeping of all these factors. Since they are materially interested they demonstrate a totally business-like attitude toward their work. This is graphically confirmed by the results of collectives, the experience of which is discussed below, as well as by the results of tens and hundreds of other collectives.

Cost Accounting and Wages

At the present time 84 percent of subdivisions are working according to collective contracts in farming. In livestock raising 72 percent of feeder cattle, 66 percent of hogs, 80 percent of hogs and almost the entire herd of sheep are being provided services by collectives working according to contracts.

The first work results of many contract collectives are very promising. Thus, last year in feeding cattle labor productivity in contract collectives was 40 percent higher, in hogbreeding--higher by a factor of 1.7 and in poultry raising--higher by a factor of 2.3. In sheep raising as a result of the mass introduction of collective contracts the load per worker as regards providing services to the herd (with a consideration of feeding) increased from 247 to 312 animals.

Work to introduce collective contracts has forced us to look in a new way at wages and at a number of other questions. Let me discuss some of them. As a rule, in enterprises that carry out the plan and that implement production effectively the wages of regular workers are high although they differ not very significantly from the kray average--by only 10-20 percent. Here the load (according to area of land cultivated and to the size of the herd being serviced) is greater by a factor of 1.4-1.5 than the kray average and labor productivity is higher by a factor of 1.5-2. In other words, in good enterprises wages are achieved by means of a great deal more labor. In economically-weak enterprises there has developed the practice of "straining" wages, of practically counting days off and not production to determine wages. All of this is hidden behind the screen of the necessity to retain people when in truth it results directly in the loss of the tie between wages and the results of labor and in social injustice.

Thus, last year, which was very dry, the collective of the second section of Kolkhoz imeni Kalinin, Turkmenskiy Rayon (director I. Savelyev), produced 192 quintals of corn for silage and 12.6 quintals of perennial grasses per hectare on dry farming land. The monthly wages of a machine operator equal 170 rubles here. In neighboring Rassvet Kolkhoz in the second section (director N. Kushnarev) half the amount of corn for silage and perennial grasses was produced. Of course the cost of the silage and straw in this enterprise is much higher. At the same time the monthly wages of the machine operator here comprise 190 rubles, which is 20 rubles more than the amount received by Kalinin machine operators.

Unfortunately, one comes across such examples fairly frequently and they involve not only wages but also the expenditure of fuel and lubricating materials, fertilizers, feeds and other material resources.

The experience of the broiler association and of our best enterprises has indicated that the answer lies in the elaboration and firm utilization of a system of expenditure norms for labor collectives. At the present time active work is being carried out in the kray to develop such norms for the production of all types of agricultural products.

In introducing collective contracts and cost accounting on farms we became convinced of the fact that wage payments to zootechnologists, veterinary workers and service personnel on farms had practically nothing to do with the results of work of contractual subdivisions. This became a topic of discussion in collectives. For this reason, specialists of the middle link now usually are included as a part of this group and receive wages according to the results achieved by the collective.

In Pravda Kolkhoz of Petrovskiy Rayon a means was found of increasing the material interest of the chairman, of the main specialists and of all management personnel and the entire collective of auxiliary services in achieving a high level of economic effectiveness in management. Here workers rejected bonuses for sunflowers and pedigree cattle (reaching seven on the salary scale, as we know). They are given bonuses from a single fund of material incentives, the size of which depends on the net income of the kolkhoz. Profits have grown sharply and profitability has increased to 40 percent. The experience of this enterprise has shown that similar incentives can be utilized not only in strong but also in low-profit enterprises.

In the kolkhozes of Apanasenkovskiy, Kochubeyevskiy, Georgiyevskiy and a number of other rayons in the course of the year directors and senior specialists are paid 80 percent of the official salary, with the rest calculated according to annual results and the quantity and quality of production.

In speaking about the introduction of cost accounting we understand that the absolute growth of expenditures, especially of material expenditures, is unavoidable. The village will continue to be equipped with technology, to utilize fertilizer, to increase and improve the material-technical base and to beautify itself. For this reason there is one direction to take here--production intensification, i.e. increasing production output per hectare and per every unit of existing material and monetary resources.

For example, how this is achieved in sheep raising, which provides the kray with about 40 percent of gross livestock production, can be seen in Petrovskiy Rayon, in the enterprises of which over 260,000 sheep are concentrated. Here intrarayon specialization has been carried out after concentrating three-fourths of the herd in six enterprises instead of 12. During the last 7 years over 20 million rubles have been invested in sheep raising. The directed feeding of young animals in lots and complexes has been organized, and the maternal component comprises up to 70 percent of the herd.

All shepherds' collectives have made a transition to brigade contracts. In the course of the year they receive an advance, and according to the year's results--supplementary payments for progeny, wool and weight gain with a consideration of the quality of products sold and of expenditures.

In striving to economize on expenditures, shepherds themselves prepare facilities for winter, clean them, disinfect and whitewash them, repair inventory and participate in feed procurement. Fewer outsiders are recruited. The load per single shepherd has increased to 250 sheep (and in the case of fattening, up to 400); expenditures have decreased by 500,000 rubles. Each

sheep yields 33 rubles of net income. The level of profitability of the branch exceeds 50 percent.

The extensive utilization of the experience of enterprises in Petrovskiy Rayon and the encompassing of almost all shepherd's brigades by collective contracts have enabled the kray to produce over 3 million lambs for the first time. The sale of breeding lambs last year increased to half a million head. This means an additional 30 million rubles in profits. The quantity and quality of wool have improved. Over 80 percent of the wool that is sold is placed in the first class category.

The Number of Production Subdivisions in Livestock Raising in Stavropol Kray Working Under Conditions of Cost Accounting (in percent)

In dairy farming	46.5
In fattening cattle	77
In hogbreeding	57
In sheep raising	99.7
In poultry raising	73

The Most Important Factor--Work With Cadres

As noted in an article by K. U. Chernenko entitled, "At the Level of Demand of Developed Socialism," for the party being involved in an enterprise means first and foremost being involved with the people who manage the enterprise. They must be helped and greater demands must be made of them.

We carried out a kray economic conference on raising the effectiveness of agricultural production, followed by two kray economic meetings (one of them on the results of the All-Union Economic Conference). There was a detailed and principled discussion of the situation existing within the economies of kolkhozes and sovkhoses and of ways to strengthen them these economies.

Recommendations on brigade contracts in all APK branches and on cost accounting were developed and introduced and a system of carrying out economic analyses on the farm, brigade, enterprise, rayon and kray levels was elaborated. It was necessary to alter the criteria for evaluating the work of cadres and to place production profitability and the level of consumption of resources at the foundation of this evaluation.

In the kray there is a single day of accounting--the second Friday of each month. On that day the workers of agricultural, party and soviet organs travel to kolkhozes and sovkhoses, where they summarize the fulfillment of cost-accounting goals at economic conferences. Party committees and councils of agroindustrial associations have begun to give more attention to strengthening the economic service.

In the kray a specific program has been developed for ideologically guaranteeing the introduction of collective contracts in the village. This is a complex of measures of an organizational, socio-economic and educational nature. The course "Collective Contracts in the Village" is being studied this year in the SEO [Sanitary-Epidemiological Department] by about 70,000 workers from the agroindustrial complex; last year 78,000 persons studied it.

In all of the kray's regions base schools of communist labor for the study and introduction of collective contracts have been established; here open courses are offered with invitations being extended to all propagandists in the region. The base school of communist labor in the dairy-market complex of Kolkhoz imeni 20 Partsyezd, which is headed by experienced propagandist G. Khorvat, is operating effectively. This same type of base school is operating in Kolkhoz imeni Ilich of Predgornyy Rayon.

In the kray there was continued development of professional orientation and labor education of schoolchildren by means of student production brigades. The enterprises of a number of rayons have introduced permanent production practicums for schoolchildren on farms, with the assignment of groups of animals to the children. Experienced preceptors oversee the practical work.

During 4 years of the five-year plan alone, the kray's sovkhozes and kolkhozes have trained 18,000 livestock farmers by means of the network of educational combines and in schools. This has enabled them to increase the availability of workers on farms to 96 percent. Among these workers one out of four is of Komsomol age and one out of six has achieved the first or second class.

During the Final Year of the Five-Year Plan

The work that has been done in the kray has yielded certain economic results. Last year for the first time it was possible to achieve a decrease in expenditures in livestock production output; all branches of the livestock industry became profitable. During the current five-year plan labor productivity in kray agriculture increased by 20 percent.

At the same time, we still have a great deal to do regarding strengthening cost accounting relations and increasing the effectiveness of livestock raising in order to prepare all kolkhozes and sovkhozes as well as other enterprises of the agroindustrial complex for work according to the principle of self-support. In our opinion, the economic potential for this has been developed. The point is to improve organizational work at all levels of management of the kray's agroindustrial complex.

This was the topic under discussion at a recent kray conference of directors of divisions of the rayon party committee and of chairmen of RAPO councils. A critical analysis was made of cost accounting subdivisions. Established was the goal to strengthen party-political work in labor collectives working according to contracts. A theme that ran through the conference was the idea that it is necessary to give the required attention to creating the essential conditions for the more extensive introduction of cost accounting and brigade contracts, to persistently strengthen intraenterprise specialization and to train cadres in economic methods of management.

During the final year of the five-year plan the kray's kolkhozes and sovkhoses have pledged to sell the state 2.02 million tons of grain, 300,000 tons of meat, 660,000 tons of milk, and 15,800 tons of pure-fiber wool. It is planned to increase the production and procurement of farm and animal products by 19 percent in comparison with the average annual level achieved during the last five-year plan.

The entire increase in the production of grain, wool and lamb, 80-85 percent of the increase in the production of meat and pork and two-thirds of the increase in the production of beef and milk must be achieved by means of intensive factors.

The intensive, urgent work that has begun in kolkhozes and sovkhoses as concerns the fulfillment of plans and obligations of the current year and of the five-year plan as a whole instill the assurance that these plans and obligations will be fulfilled and that the kray's agricultural workers will meet our party's 27th congress worthily.

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AGRO-ECONOMICS AND ORGANIZATION

PASKAR, OFFICIALS ADDRESS CONFERENCE ON AGRO-INDUSTRIAL TASKS

Moscow IZVESTIYA in Russian 18 Nov 85 p 2

[Article by V. Stepanenko, special correspondent for IZVESTIA: "Tasks of Agro-industry; Deputy Preparatory Committee Meets"]

[Text] The grain field and farm have always been the subject of tireless concern for village workers. To be more exact--party and government concerns. Nationwide concerns. And this is understood: grain and other food products, the raw materials of agriculture--all this begins here.

Today plant-growing and animal husbandry, by virtue of equipment saturation and mobility, and by virtue of scientifically based technologies, is well matched with industrial production. And in order to cultivate, harvest, transport, store, process, and deliver to the consumer each kilogram of agricultural production, nationwide efforts are truly needed.

The future increase in the productivity of fields and farms--and this means reliably providing the country with food products and raw materials--is inseparable today from the work level of all branches of national industry which comprise the agro-industrial complex.

In the preparatory commission which beforehand examined the country's agro-industry indicators provided for in the projects of the State plan for economic and social development of the USSR and of the State budget for 1986, and which also analyzed the progress of the fulfillment of planned tasks in the present year and the 1984 budget fulfillment, the talk was about the work of the agro-industrial complex, its financing and direction, as a single entity.

The importance and urgency of the questions predetermined the make-up of the participating group. Deputies invited more than 100 persons--representatives of 32 national ministries, departments, and the VtsSPS [All-Union Central Trade Union Council] to the Great Kremlin Palace where the meeting took place.

This was an open discussion, on principle, of questions concerning a radical improvement of the work of the whole agro-industrial complex. The discussion embraced a wide circle of current and perspective problems--economic, organizational, and social--the activity of ministries and departments, and each link of agro-industry. Progressive methods, reserves of production, and neglected possibilities were accurately and critically analyzed. The technical

reconstruction and qualitative transformation of the material-technical base of agriculture and the processing industry are urgent matters. There is one guideline here: to spend less and aim higher in the Twelfth 5-Year Plan.

In his report the first deputy of the chairman of Gosplan USSR P.A. Paskar analyzed the progress of the Food Program, and he especially emphasized the distinguishing features of the plan for 1986--the speeding up of development and the intensification of all branches of the agro-industrial complex on the basis of scientific technical progress, the improvement of the utilization of the present productive potential, better safe-keeping, more thorough and rational processing of agricultural raw materials, and an increase in the quality and a broadening of the assortment of finished goods. The report of V.N. Semenov, head of the department of financing for agriculture in the USSR Ministry of Finances, dealt with a more complete utilization of internal production reserves, a strengthening of the regime for economizing, and the rational expenditure of government means. The leaders of 12 departments in the agro-industrial complex gave reports.

Both in reports and in statements it was noted that in 1985 the transition of agriculture to an industrial base was consistently realized and that production and the purchase of a number of basic agricultural products increased. But there is no cause for complacency. Although during the present 5-year plan the per capita demand for meat, vegetables, fruits and berries increased, there still remain tasks projected by the Food Program for 1985. In government resources a significant quantity of agricultural production will be delivered short. This is something to think about.

This is why the deputies have demanded from leaders of ministries and departments, who presented reports and statements, a concrete, accurate and self-critical analysis: why have plans been broken? Why have certain mistakes been allowed? We are entering a new 5-year plan, said the deputies, and in 1986 it is intended to increase gross production of agriculture and animal-raising by almost nine percent of the average annual volume which is expected according to the totals of the present 5-year period--and this obliges us to evaluate more thoroughly and more exactly what has been done.

In their presentations the chairman of the preparatory committee F.T. Morgun and deputies Ye.N. Auyelbekov, M.I. Klepikov, N.F. Tatarchuk, V.I. Kalashnikov, I.I. Kuleshov, Ye.V. Balakina, V.O. Oyun, I.M. Ostapenko, V.D. Zabolotniy, Kh. T. Veldi, D.I. Kachin, and Z.S. Kovalchuk, subjected to a critical analysis the activities of the Union ministries and departments--partners in the agro-industrial complex. In all, more than fifty pointed and topical questions were asked the leaders and responsible workers of these ministries.

The year 1986 foresees the expansion of acreage under technologically intensive grain crop production by 31.3 million hectares, and, as a result of this, a yield of approximately 26 million tons of grain. And what is the effect of intensive technology in 1985? In spite of all the caprices of nature and a sizeable increase in the harvest, many farms got 15-20 centners per hectare more than with the usual technology for grain production.

And here--the questions of the deputies: why in a number of districts of the Ukraine has winter wheat lodged. Why in the Altai region have only 14 centners per hectare of spring grains been obtained when 25-30 were calculated? Why is there the same situation in Novosibirsk Oblast and other oblasts? Extremely scarce and costly chemical preparations, mineral fertilizers and other material-technical means have been wasted. Who is responsible for the disruption of technological discipline? The conclusion: it is necessary to more strictly hold responsible farm managers and agronomists, and to teach personnel how to work the fields properly. Everything depends on thorough knowledge.

One more example: during the years of the Tenth 5-Year Plan, the yield of corn comprised on the average 32.2 centners per hectare. And in the Eleventh 5-Year Plan, under intensive technology it was 32.6 centners. This is practically no increase. Only the cost of grain increased. And again the questions: why such inferior agro-technology? Why such backward seed production? Where are the agronomists? Where is RAPO? Incidentally, in the last years questions have been raised more than once regarding the betterment of seed production and the improvement of the quality of seeds. However, no particular changes have occurred yet.

In 1986 the basic increase in animal husbandry production should come by raising the productivity of the public sector's herd. In particular it is proposed to bring the average yield of milk from a cow to 2,475 kilograms. These are good plans. But the deputies have questions about both animal production and feed production.

"What measures are being taken to deliver cooled milk to processing plants? The deputies were told that this question has been decided in principle: cooling installations are planned for each animal-raising complex or farm. Planned--this does not mean they are operating. In Estonia, for example, cooled milk comprises 95 percent of the general quantity, while in the Russian Federation and Kazakhstan less than half, and in Uzbekistan, Georgia, Azerbaijan and Armenia 5 to 7 percent in all.

Another question: in the years 1981-1984, 786,000 hectares of irrigated hayfields and pastures were planted, but the increase during these years comprised, according to data from the USSR TsSU [Central Statistical Administration], 39,000 hectares in all--only five percent of the area planted. What does this mean? How is such a discrepancy explained?

Actually an explanation is not easy. The deputies declared unsatisfactory the explanations that "irrigated" areas "simply were not accounted for because of the absence or loss of water sources," and that "errors in plans showed up." And they expressed a serious anxiety: government-funded means of the meliorization of hayfields and pasture have still not provided the necessary return--the productivity of these areas remains at the level of the Eighth 5-Year Plan.

Particular attention at the committee session was devoted to the future development of the material-technical base for the processing branches of the agro-industrial complex. Projected plans provide for overcoming those disproportions which came into being between the level of product output and the means for its

transport, receiving, storage, processing and distribution. It is planned that the introduction of productive capabilities in the Twelfth 5-Year Plan in the majority of branches will increase by 1-1/2 - 2 times in comparison with the 11th. They intend to increase significantly the supply of better and more reliable technological equipment. This will allow, as it was noted, an improvement in the balance between capacity and raw material resources intended for processing.

The demands--to improve the product quality, to eliminate losses in all phases of its production and distribution, to increase significantly the effectiveness of capital investments provided for the agro-industrial complex--became the subject of a principled, business-like discussion of the committee members. It could not fail to upset the deputies that Glavmikrobioprom [expansion unknown], because of poor utilization of productive capacities, annually shortchanges the peoples economy by more than 300 million rubles in production. Great anxiety was brought about by the lowly quality of budget plan documentation on the construction of mill factories, the lay in commissioning store houses and grain-drying facilities; there is not always a rational placement of processing facilities. The deputies focused on the poor quality of technology (every year 15-25 percent of tractors and combines are returned by inspectors to several facilities of Minselkhoz mash [Ministry of Tractor and Agricultural Machine Building] for repair); on the production of substandard mixed fodder (in Kazakhstan, for example, in its production the deviation from the norm in comparison with last year increased five-fold); they focused on the serious deficiencies in the work of Minselstroy [Ministry of Rural Construction]: plans are not fulfilled, and there is construction of projects having nothing to do with the Food Program. The deputies posed pointed questions about housing construction and living conditions.

At the session recommendations were approved, which will go into the findings of the Planning-Budgetary Commission and other permanent commissions on the State Government Plan for Economic and Social Development of the USSR and of the Government Budget of the USSR for 1986.

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AGRO-ECONOMICS AND ORGANIZATION

ROLE OF CONSUMER COOPERATIVES IN TAJIK APK SYSTEM

Dushanbe SELSKOYE KHOZYAYSTVO TADZHIKISTANA in Russian No 7, Jul 85 pp 23-27

[Article by I. Usmanov, candidate of economic sciences: "Consumer Cooperatives within the System of the Agroindustrial Complex"]

[Text] As a socio-economic organization the republic's consumer cooperative maintains multi-faceted ties with the agroindustrial complex based on common goals and tasks, on the multi-branch nature of operations and on the extensive participation of consumer unions and cooperatives in fulfilling functions related to the procurement, production, processing and sale of agricultural products.

The role of the republic's consumer cooperatives within the agroindustrial complex and in fulfilling its main goal, that of increasing production volume and of improving the quality of agricultural products, is determined to a large extent by its level of development as well as by a number of regional factors and operation conditions of branches.

At the present time consumer cooperatives provide services to over 70 percent of the republic's population. The proportion of commodity turnover of cooperative trade within total commodity turnover in Tajikistan comprises over 50 percent, which is 20 percent greater than in the country as a whole.

During the years of the 11th Five-Year Plan retail commodity turnover in Tajikistan's consumer cooperatives increased by 27.1 percent and by late 1984 comprised 1,443.9 million rubles. Here turnover of food items increased by 25.5 percent and comprised 653.7 million rubles.

A significant portion of products from the republic's agroindustrial complex is sold by enterprises of commission trade and public nutrition within the consumer-cooperative system. In 1981-1984 turnover related to the sale of agricultural products procured according to contract prices grew at a forestalling rate.

In 1984 the sales volume for agricultural products comprised 271.0 million rubles, which is an increase of 49.8 percent over 1981.

Cooperative organizations play a considerable role in the procurement and processing of agricultural products, thereby making a significant contribution towards increasing feed resources. The republic's consumer unions and cooperatives procure valuable types of products and raw materials such as honey, fruit, berries, nuts and so forth. These products comprise 36 percent of the general volume of procurement in the republic.

The republic's consumer cooperatives also make a definite contribution to the country's APK [Agroindustrial complex] system. Each year cooperative organizations contribute 38,000 tons of melons and 18,000 tons of onions and other agricultural products to the common national fund.

During the 11th Five-Year Plan the volume of procurement of potatoes, eggs, vegetables and fruits increased. The republic's cooperative organizations are prevalent in the procurement of a number of agricultural products.

Cooperatives encourage growth in agricultural production output, stimulating its development in private plots of citizens. This facilitates an increase in procurement of agricultural products from the population.

However, it should be noted that reserves for the continued growth in procurement of agricultural products from the population are not yet being utilized in full measure. This is attested to by the fact that the share of the republic's kolkhoz market in the sale of feed products is still larger than that of cooperative commission trade. In connection with this, it is necessary to more widely develop active forms of product procurement, such as for example the per farm route of suppliers, to strengthen educational work among the population, to establish long-term contractual relations with the population, and to expand the countersale of consumer articles and mixed feeds to village residents who sell agricultural products to consumer cooperatives. It is also important to increase the sale of inventory, and particularly of the means of light mechanization, to the owners of private plots.

Dynamics of Procurement of Surplus Basic Agricultural Products From the Population During Four Years of the 11th Five-Year Plan

Products	Year		1984, in % to 1980
	1980	1984	
Meat, tons	5727	10043	175.4
Milk and dairy products, tons	196	277	141.3
Eggs, thousands of	966	3430	355.1
Honey, tons	1431	1786	124.8
Potatoes, tons	5340	6126	114.7
Vegetables, tons	10786	22264	206.4
Fruit, tons	1812	3528	194.7

One of the most important conditions for growth in the procurement of agricultural products from the population involves strengthening the material-technical base of procurement. In particular, we must expand the network of

universal reception-procurement points, of procurement-market bases and of city cooperatives. This will enable the population to sell various types of products in a single place with minimal expenditures of time.

Stores-reception points are quite effective. Such enterprises procure products from the population and simultaneously carry on trade in goods that are needed to manage the private plot. In agreement with procurement bureaus they conclude contracts with the population concerning the sale of agricultural products.

In recent years Tajikistan's cooperative organizations have strengthened attention to questions of developing a material-technical base for procurement. For the 11th Five-Year Plan 5.6 million rubles were allocated for the building of procurement points, which is significantly more than was spent for this purpose during the preceding five-year plan. In the future it is planned to build a universal reception point in every large village. This will enable us to increase the contribution of the republic's cooperative organizations to the fulfillment of the Food Program.

As of the beginning of the current year 15 city cooperative trading organizations were functioning within the system of consumer cooperatives; of these, seven were located in the southern zone--Dushanbinskiy, Leninskiy, Gissarskiy, Orzhonikidzeabadskiy, Tursunzadevskiy, Kulyabskiy and Kurgan-Tyubinskiy--with a total commodity turnover volume of 12,071,100 rubles in 1984, and eight in the northern zone within the system of the Leninabad Oblast Consumer Union--Leninabadskiy, Isfarinskiy, Kanibadamskiy, Pendzhikentskiy, Nauskiy, Ura-Tyubinskiy, Proletarskiy and Khodzentskiy--with a total commodity turnover volume of 18,018,000 rubles.

City cooperative trading organizations carry out the procurement and sale of agricultural products through their own stores, which are located in the city and rayon centers of the republic. As of 1 January 1985 the system of city cooperative trading organizations included 103 stores with a total area of 4,656 square meters. The average area of one store is 45.2 square meters, which enables workers to carry out the reception and sale of agricultural products in associated zones.

However, it should be noted that cooperative organizations are building their stores for the reception and sale of agricultural products without the required economic foundation. These stores are usually located in markets or in city or rayon centers not far from each other. This type of distribution is convenient to only a small part of the population. With the goal of improving the organization of product procurement in kolkhozes and private plots it is extremely important to locate these stores on the territories of cities and rayons with a consideration of the market resources and other operating conditions of agroindustrial complexes.

To avoid errors in the distribution of stores for the reception and sale of agricultural products it is important to have information on the dynamics of the number of private plots in enterprises and on the size of herd being maintained here and to know the size of private plots in every settlement in the rayon. This type of information can be obtained in rayon executive

committees of soviets of people's deputies and it is also contained in official statistical documents (forms No 9-s and No 6-s).

Rayon cooperative organizations do not always give the necessary attention to generalizing this information, although its significance for improving plan-economic procurement work would be difficult to overestimate. As a rule, insufficient consideration of production conditions in private plots is based on the difficulty of generalizing information. For this reason, in every rayon cooperative organization it is essential to collect and accumulate information about the level of development of kolkhozes and private subsidiary enterprises of the given rayon. Generalized data can be used successfully not only as the foundation for the distribution of stores but also for concluding contracts with suppliers of agricultural products as well as for establishing routes for mobile reception-procurement points.

The availability of useful information that provides an overall characterization of production conditions in kolkhozes and private plots of citizens will not only avoid the inefficient use of capital investments during the building of stores but will also achieve effectiveness in procurement organization and will enable workers to achieve intensity and validity in plan targets assigned to every procurer.

Measures are being taken in the republic to further strengthen cooperation between cooperative organizations and agroindustrial associations in the area of procurement of agricultural products. We must determine the zones to which enterprises which sell products will be assigned and we must expand the reception of these products directly in the place of their production. Cooperative procurement organizations improve packaging supplies to kolkhozes and sovkhoses in accordance with contract agreements.

The republic's consumer unions and cooperatives are implementing extensive measures directed at increasing the productivity of their own enterprises. The latter have become widespread, especially during the present five-year plan. They sell their own products to the population primarily by means of the network of enterprises of public nutrition and city cooperative trading organizations.

Cattle, sheep and poultry are fattened and vegetables and other agricultural crops are raised in auxiliary enterprises of Tajikistan's cooperative organizations. It should be noted that products from auxiliary farms of public-nutrition enterprises are an important aid in supplying cooperative cafeterias, coffee houses and restaurants with meat and dairy products and vegetables; deliveries from these auxiliary farms contribute to an expansion of the assortment and to an improvement in the quality of dishes.

In order to further increase production volume and decrease production costs in auxiliary enterprises it is necessary to organize their central supply with feeds and the means of mechanization of various technological processes.

As we know, a significant contribution to the development of so-called post-production stages in APK operations involves the processing and sale of agricultural products, which is carried out in cooperative enterprises of

public nutrition and industry. They are increasing their production output volume from year to year.

Growth in the volume of production processing in enterprises of public nutrition contributes to their transition to an industrial base. Enterprises and shops for the production of semi-finished products are being built and the network of culinary stores is being expanded. It should be noted that the processing of products by enterprises of public nutrition curtails their path from the field to the consumer.

The cooperative industry is playing a more and more significant role in the processing of agricultural products. The gross production volume of enterprises of the consumer cooperative food industry involved in the processing of agricultural products and raw materials is increasing from year to year. Industrial enterprises of Tadzhikpotrebsoyuz [Tajik Union of Consumer Cooperatives] produce a wide assortment of food articles, including various types of canned goods and dry fruits. Over half of the bread products baked in the republic come from consumer cooperatives; this includes national types of products which are greatly in demand by the population.

In the process of the functioning of the APK, and in particular of rayon agroindustrial associations, several difficulties and unsolved problems were discovered. It has not yet been possible to eliminate the departmental separateness of branches which make up the APK, and this has a negative effect on the end results of operations--the mechanism for stimulating workers has not yet been adjusted. Here it is essential to create a specialized stimulation fund by means of decreasing various losses during production, storage and processing in order to stimulate APK workers' interest in the end result--the sales volume of quality products.

An important task is that of increasing the role of consumer cooperatives in transforming village points into well-organized settlements and in creating a contemporary infrastructure for the village. We must unify the efforts of the cooperative organizations of kolkhozes, sovkhoses and other enterprises of the agroindustrial complex for the building of new and renovation of existing trade and public-nutrition enterprises. It is expedient to more extensively practice the consolidation of a portion of resources from cooperative organizations with resources from agroindustrial associations for the purpose of joint influence on building and operation of storehouses for agricultural products and objects that will be used for social-consumer and cultural purposes.

At the present time the interrelated development of agricultural production and consumer cooperatives has been manifested in the development of a material-technical base for commission trade in agricultural products. In 1981-1984 the republic's kolkhozes and sovkhoses built stores, cafeterias, chaikhans [tea houses in Central Asia] and trading centers worth 3,638,400 rubles for cooperative organizations. This includes the purchase from kolkhozes and sovkhoses in 1981 of stores, cafeterias, chaikhans and other objects used for social-consumer and cultural purposes worth 642,200 rubles, in 1982--worth 590,500 rubles, in 1983--worth 1,605,700 rubles and in 1984--worth 800,000 rubles. This practice will continue to be developed.

The associated development of agricultural production and consumer cooperatives requires a new approach toward establishing economic ties between the RAPO [Rayon Agroindustrial Association] and cooperative organizations. Previously these ties were implemented within the framework of kolkhozes, sovkhozes and consumer societies by means of rendering reimbursed and non-reimbursed services. Under conditions in which the composition of agroindustrial associations includes rayon consumer unions it is essential to further strengthen these ties, adjusted to new circumstances.

Cooperative and agricultural enterprises in the operations zone of agroindustrial complexes involved in the production and processing of fruit and vegetable products must jointly develop plans related to economic activities and the formation of a structure for production management and for the processing and sale of products. It is important to attract representatives of organizations which make up the APK to plan-development work.

On the scale of the rayon link there should be a strengthening of the role of planning organs, and on the republic scale--of the role of Tajik SSR Gosplan in coordinating these plans. Joint planning is based on the fact that the republic's consumer cooperatives have a number of canning combines which need supplies of raw materials in the course of the year and that agricultural enterprises experience a great shortage in terms of a stable material-technical and manpower base during the season when fruits, berries and vegetables are being harvested. These problems can be dealt with successfully only with joint cooperation, at the basis of which we must have mutually-advantageous ties, joint planning of the development of cooperative enterprises as an integral part of the APK, the evaluation of operations of APK branches according to degree of influence on labor productivity in agricultural production and a specific contribution to increasing the output of the APK's end product.

Fruitful cooperation between cooperative organizations and agroindustrial associations not only improves the effectiveness of the operations of the agricultural sector of the country's economy and the branches of consumer cooperatives but also encourages the development and coming together of cooperative property with common public property and an improvement in material and cultural conditions in the life of the village population.

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AGRO-ECONOMICS AND ORGANIZATION

MESYATS ON APPLICATION OF SCIENCE, TECHNOLOGY IN AGRICULTURE

Moscow AGITATOR in Russian No 18, Sep 85 pp 17-21

[Article by V. Mesyats, USSR Minister of Agriculture, under the rubric, "The Food Program in Action": "Along the Path of Intensification"]

[Text] The decisions of the April 1985 Plenum of the CPSU Central Committee have been fully understood and supported by communists and all workers. The tasks brought forth during this plenum as well as during a meeting of the party's central committee on questions of accelerating scientific-technical progress have a direct relationship to the country's agricultural shop. Under modern conditions the responsibility of village workers for the continued and more energetic improvement of the economy and for the accelerated intensification of agricultural production is increasing. The high level of party demands is the main orienting force in the struggle for the successful fulfillment of the national Food Program.

The course of the program's fulfillment and branch development as a whole during the last few years show that the implementation of the measures indicated by the party with regard to transforming the country's agroindustrial complex into a highly developed sector of the socialist economy yields noticeable results and has a positive effect on increasing the volume of production output. At the present time the USSR, which has 5.8 percent of the world's population, produces almost one-fifth of the milk, over 11 percent of the meat, almost 14 percent of eggs, a third of potatoes and 31 percent of the sugar beets produced in the world. In terms of the level of per capita consumption of products the Soviet Union is one of the most developed countries in the world.

In 1983 and 1984 gross agricultural production reached 135 billion rubles. This is 11 billion more than the annual average for the 10th Five-Year Plan. The table provides a clear understanding of how goals of the Food Program are being fulfilled as regards some types of food products.

As we can see from the data, actual production output is quite close to plan goals, and even surpasses the plan in some cases.

The changes in livestock raising are especially satisfying. In 1983-1984 as compared to average levels for 1981-1982 the sale to the state of livestock

Table

	Average annual production planned by Food Program for 11th Five-Year Plan	Actual production	
		1983	1984
Meat (millions of tons)	17-17.5	16.4	16.7
Milk (millions of tons)	97-99	96.4	97.6
Eggs (billions)	72	75.1	76.0
Vegetables and melon crops (millions of tons)	33-34	33.8	34.7
Fruits and berries (millions of tons)	11-12	11.5	10
Grapes (millions of tons)	7.5-8	6.4	8.1

products and poultry increased by 11 percent, of milk--by 14 percent, and of eggs--by 7 percent. This year the country's farmers are securing and developing the results that have been achieved.

In other words, under the leadership of party, soviet and economic organs village workers have taken significant steps forward as regards the implementation of the Food Program and the improvement of supplies of valuable food products to the population. At the same time, the level of production growth that has been achieved does not fully guarantee the satisfaction of rapidly-increasing demand in the country for food and agricultural raw materials.

To a significant degree the underproduction of products is the result of the severe natural-climatic conditions under which agricultural operations must be carried out, but it would not be objective to describe the tolerated lags only by means of this. Here the greatest effect is felt first and foremost by the fact that in many enterprises production is still carried out not on an intensive, but on an extensive basis. As a result, the productivity of agricultural crops and of livestock raising is increasing slowly. Thus, average daily weight gains of cattle do not exceed 480-500 grams on the average throughout the country, and the time needed to raise and fatten animals extends to 30-35 months; the corresponding figures for hogs are 330-340 grams and 400-420 days. A great overconsumption of feed and a high level of barrenness in the female parent herd are tolerated. Kolkhozes and sovkhozes bear significant losses as a result of diseases and the death of animals.

The picture is different in leading enterprises where production is based on intensive methods, on the achievements of scientific-technical progress and on strict labor and technological discipline, where land, equipment and fertilizer are used with a large return and where there is no room for mismanagement. Here weighty and even record harvests are produced regularly regardless of weather conditions, the appropriate level is achieved in livestock raising and from one year to the next plans and obligations related to the sale to the state of all types of agricultural products are fulfilled

and overfulfilled. For example, Borests Kolkhoz in suburban Moscow last year achieved a productivity of 42 quintals of grains, 346 quintals of potatoes and 626 quintals of vegetables per hectare. In this enterprise milk yield per cow reached almost 5,000 kilograms. The enterprise fulfilled the 1984 plan for the sale of grain to the state by 206 percent, of potatoes--by 184 percent, of vegetables--by 135 percent and of livestock products--by 113 percent. In Belorussia's Rassvet Kolkhoz imeni K. Orlovskiy (Mogilev Oblast) in 1984 the productivity of grains exceeded 44 quintals per hectare; of potatoes--280 quintals. Average daily weight gain comprised 886 grams. The year's plans and obligations have been fulfilled successfully.

There are thousands of enterprises in the country which struggle persistently for high-quality farming and livestock raising and who achieve excellent results on this basis. They exist everywhere. Making their experience the achievement of every kolkhoz and sovkhoz, bringing lagging collectives up to the level of average and leading enterprises means elevating all agricultural production in the country to the level which will fully meet the demand for field and farm products. It is for this reason that the party is orienting village workers toward accelerating scientific-technical progress within the branch and toward maximally outfitting all of its links for the purpose of fulfilling the tasks of the Food Program by means of the highly-efficient use of the accumulated powerful economic base of the village and of all internal reserves as well as by means of the creative introduction into daily practice of the achievements of science and progressive experience and of a high level of organization and discipline.

The possibilities for this do exist, and they are considerable. The material-technical, scientific and cadres potential created within agriculture facilitates a bold approach to dealing with this task. In 1984 the cost of fixed production capital for agricultural purposes reached 294 billion rubles, which is 24 percent higher than 1981 levels. Energy capacities surpassed 719 million horsepower and the energy available per worker equals over 30 horsepower. The deliveries of mineral fertilizers and chemical means for plant protection are increasing. The fund of reclaimed lands has reached 34 million hectares.

All of this has enabled us to almost completely mechanize basic field operations, to approach the completion of overall mechanization of production processes, to assimilate zonal farming systems everywhere and to expand the scale on which industrial and intensive technologies and progressive forms of organization and wages are utilized.

In livestock raising we are implementing a course toward production specialization and concentration and toward a transition of the branch to an industrial base. In the country 3,690 large livestock-raising complexes have been built and are in operation. The USSR Ptitseprom [Poultry Industry Association] system is developing at a rapid pace.

Multi-level problems related to the social transformation of the village are being dealt with in a consistent manner. Concern for people and for improving their work, rest and everyday living conditions are assigned no less importance than production questions. According to calculations, during the

1980's 160 billion rubles of state resources will be used for social needs. Residential and cultural-consumer building is being carried out on a large scale. Medical services to the village population have improved considerably. The network of children's preschool institutions, houses of rest, sanatoriums, pioneer camps and sports facilities has expanded.

Extensive attention is being given to the preparation and retention in the village of cadres, especially of young people--the future of our villages. With this goal in mind, in addition to providing young specialists with various consumer and material privileges, a great deal is being done in the area of work education, an important form of which is the school of tutorship, where recognized masters share their rich experience with the younger generation, thereby inculcating a love for the land and for the chosen profession in these young people. Over 2 million specialists with a secondary and a higher special education, about 5 million machine operators and over 5 million livestock farmers work in agriculture in this country. These are primarily highly-trained workers capable of solving the extremely responsible tasks placed before village workers on a level required by modern-day needs.

A strategic factor in intensification within the village is that of accelerating scientific-technical progress. In farming its main link is the continued improvement in production quality on the basis of the extensive assimilation and improvement of scientifically-based systems of farming, industrialization and intensive technologies for cultivating crops.

Experience shows that such technologies enable farmers to produce an additional 10-15 quintals of grain, 6-10 quintals of corn seed, 3-5 quintals of sunflower seeds, 40-45 quintals of sugar beets and 55-60 quintals of potatoes per hectare even under severe weather conditions. This year such technologies have been assimilated on an area of over 28 million hectares; on 17 million of these hectares winter and spring wheats are cultivated according to intensive technologies.

In accordance with the resolution passed by the CPSU Central Committee and the government, in 1986 grain crops will be cultivated according to intensive technology on 31.3 million hectares. Today the main concern of farmers is to carry out the sowing of winter grains according to intensive technologies in an organized manner and to provide all that is necessary in order to obtain a full-weight return on them by means of the harvest.

The future is behind industrial and intensive technologies. As early as the end of the 12th Five-Year Plan they will be used to raise grain crops on an area of 60 million hectares, which will enable us to deal with the problem of the stability of the grain enterprise and to obtain a million tons of high-quality products with stability.

A no less important problem is that of creating a dependable feed base for livestock raising with the goal of further intensification and of achieving the goals foreseen by the Food Program more rapidly.

As we have already noted, positive changes have occurred here, made possible to a large extent by the noticeable increase in the production of coarse and

succulent feeds. Thus, in 1983-1984 average annual gross hay yield increased by almost 20 percent in comparison to the levels of the 10th Five-Year Plan, and the procurement of succulent feeds--by 59 percent. In many oblasts and republics the production of combination silage has improved and the procurement of corn with ears in the milky and milky-wax stages of ripeness is being practiced more widely. A feed industry of one's own, created in most kolkhozes and sovkhoses, has enabled us to improve the quality of procured feed.

This year too kolkhozes and sovkhoses struggled persistently for the further strengthening of the feed base and for the creation of a dependable reserve of forage for the winter stall-upkeep period. Feed harvesting and transportation means were prepared in good time and with a high degree of organization. Spring arrived late in a number of regions and the shortage of warmth for the active growth of grasses and long drawn-out rains during the period of mass hay cutting greatly complicated feed-harvesting work. But despite this, as of 26 August kolkhozes and sovkhoses had stockpiled over 65 million tons of hay (83 percent of the plan), 74.4 million tons of haylage (111 percent) and 5.6 million tons of artificially-dessicated feeds (66 percent of the plan). A total of 8.9 quintals of feed units were procured per standard head of cattle, which is 0.6 percent more than on the same date last year.

A large and probably decisive role in this was played by the extensive use of progressive technologies such as the preparation of hay by means of active ventilation, pressing, and the stockpiling of silage with the addition of chemical preservatives, which provided the opportunity to decrease the effect of bad weather on the volume and quality of procured feeds. The village workers of Belorussia, Latvia, and Moscow, Kaluga, Belgorod, Dnepropetrovsk and other oblasts have been pioneers in introducing these technologies.

Of course it cannot be said that the feed problem has been solved once and for all. Considerable intensive work remains to be done. It is essential to further unfailingly implement a policy directed at fully supplying livestock raising with traditional coarse and succulent feeds, thereby decreasing the expenditure of grain for feed purposes.

The basic condition of scientific-technical progress in livestock raising is the purposeful improvement of the breed composition of the public herd and the continued development of breeding work. A foundation has been built to accomplish this.

The qualitative transformation of the dairy herd is being implemented primarily by means of its Holsteinization, which yields good results. Animals produced by this method provide large milk yields everywhere when the quality of feeding is high. In accordance with the elaborated program, the volume of crossbreeding of native breeds with the Holstein-Friesian will increase constantly. It is also planned to accelerate the development of beef cattle raising by using highly productive sires of the best breeds and to continue work on hybridization of hogs. Already this year almost 35 million hybrid hogs are being fattened. Using the same quantity of feed, they yield a weight gain that is 8-10 percent greater than that of pure breeds.

A pressing task is that of increasing the effectiveness of scientific research and of introducing biotechnology, and first and foremost of embryo transplantation, into the practice of livestock raising with the goal of obtaining valuable sires. Today in this country we have eight centers where embryo transplantation is carried out, and support points are being organized in leading kolkhozes and sovkhozes. By the end of the next five-year plan it is planned to create an additional 36 centers with embryo banks and to carry out 30,000 embryo transplants during this time.

The implementation of these and other measures will allow us to develop a highly productive herd, which together with the accelerated development of the feed industry, with the assimilation of progressive technologies for raising livestock and with dependable veterinary services in farms and complexes, will provide the opportunity to fully satisfy demand for high-quality livestock products.

Scientific-technical progress and industrial production methods place great demands on strict adherence to technological discipline. Any deviation from it will result in a sharp decrease in results. This is why today the village specialist--the engineer, agronomist or zootechnologist--must have complete knowledge of the technological parameters of this operation and strive to adhere strictly to these parameters.

An essential condition for scientific-technical progress is the production of more of a better-quality product with fewer expenditures of labor and resources. This progress is unthinkable without the most precise attention to the economy. Today everyone in the village, from the director to the rank-and-file worker, must be an economist, i.e. he must see not only his section but production as a whole, he must know the basic factors involved in production effectiveness and he must be able to implement them.

The greatest possibilities in this plan are provided by cost accounting and progressive forms of organization and reimbursement of labor. Collective contracts inspire people to implement a strict economic regimen, to acquire economic knowledge, without which it is impossible to manage the land in earnest, and to introduce the achievements of scientific-technical progress.

The main line in the struggle to accelerate scientific-technical progress lies at the junction of science and production. Under contemporary conditions, in addition to strengthening scientific research in the basic directions that achieve a high level of branch effectiveness, more efficient mutual ties between scientists and practical workers and a more flexible system of introducing completed elaborations are needed with the goal of achieving a full-weight return on science as quickly as possible and of having science work for the intensification of agriculture to the full degree.

In the most responsible areas we find shock work being performed by a detachment of several thousand production innovators, the right flank of socialist competition and true leaders of scientific-technical progress in the village. It is they, the worthy successors of the Stakhanov movement, who by their tireless striving to seek out, find and use all that is new and progressive in their work make a vital creative contribution to everyday

activities, who raise these activities to the heights of labor exploits and who with their labor multiply the glory of the Soviet peasant and the riches of the homeland.

Many kind words can be said, for example, about the senior agronomist of Kolkhoz-Breeding Plant imeni V. I. Lenin of Tula Oblast, V. V. Gorelov, who is an experienced specialist and skilful organizer. High-quality farming and the introduction of the latest scientific achievements and valuable experience helped the kolkhoz in 1984 to fulfill its plan for the sale of grain to the state by 127 percent (with a productivity of 51 quintals per hectare) and of sugar beets cultivated according to the industrial method--by 168 percent.

A good knowledge of all of the fine points of the technology for cultivating rice and the timely and quality care for crops enabled the field brigade of Sovkhoz imeni Dzhambul of Kzyl-Orda Oblast, Kazakhstan, headed by Zh. Kozhauov, to achieve a yield of over 71 quintals per hectare.

I. I. Degtev, link leader of the feed production link of Slavnoye Sovkhoz, Crimea Oblast, Ukraine, has been working in the village for 36 years. Having assimilated the progressive technology of feed production in an excellent manner and working according to collective contracts, his link last year increased the productivity of feed crops to 82 quintals of feed units per hectare. The brigade headed by E. Yu. Martinaytis of Raudonoy Zhvaygdzhe Kolkhoz in the Lithuanian SSR has been supplying its enterprise with high-quality feeds at a constant rate and fully.

Operators of machine milking of cows in Ruchi Sovkhoz of Leningrad Oblast, G. I. Vasilyeva and A. A. Medvedeva, who organized work according to the flow shop system, have increased milk yield per cow to almost 5,000 kilograms. The senior shepherd of Sovkhoz imeni V. I. Lenin of Osh Oblast, Kirzhiz SSR, R. Zhalyshv, heads a brigade that works according to collective contracts and takes care of four large flocks of sheep of 400 head each. During the 11th Five-Year Plan the yield of wool here increased by 31 percent as compared to the preceding five-year plan, and the number of progeny per 100 ewes--by 22. In 1984 R. Zhapyshev achieved a wool yield of 6.1 kilograms per sheep (160 percent of the plan) and a yield of 186 lambs per 100 ewes.

All production innovators are agitators and concerned mentors of young people. By sharing their knowledge generously and by widely propagandizing the achievements of science and progressive experience they increase the ranks of followers and students. It is in their dependable hands, rich experience and selfless labor that scientific-technical progress in agricultural production is embodied.

This is a stressful and responsible period in the village. The main concern is to complete harvesting and to lay a dependable foundation for the harvest of the first year of the 12th Five-Year Plan as well as to prepare well for the wintering period of cattle. Life itself requires maximal effort and personal participation from every village worker in implementing those radical changes which were planned by the party to intensify agricultural production.

Kolkhoz farmers and sovkhoz workers, having begun a shock labor watch in honor of the 27th CPSU Congress, have begun socialist competition on a wide scale and are taking on obligations related to accelerating scientific-technical progress and raising the effectiveness of production and the quality of agricultural products. Village party organizations, supported by their aktiv, are mobilizing the initiative and energy of people in order to successfully complete the last year of the 11th Five-Year Plan and to do everything that is necessary to carry out the country's Food Program.

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AGRO-ECONOMICS AND ORGANIZATION

PEOPLE'S CONTROL OFFICIAL ON PRIVATE PLOT PROBLEMS

Moscow SELSKAYA ZHIZN in Russian 23 Nov 85 p 2

[Interview with Sector Chief Viktor Aleksandrovich Krykanov of the USSR Committee of People's Control by correspondent A. Chupakhin: "Is the Farmstead Being Filled?"]

[Text] [Question] As far as we know, Viktor Aleksandrovich, the committee conducted an inspection of private subsidiary farms this summer. Why and where was it conducted?

[Answer] In September 1977 and again in January 1981, the CPSU Central Committee and USSR Council of Ministers adopted decrees with the aim of developing the subsidiary farms of kolkhoz members, workers, employees and other citizens. The aim of the party and government was clear: Although kolkhozes, sovkhoses and agroindustrial associations are mainly responsible for supplying the country with agricultural products, subsidiary farms will also be used to supplement resources. This aim is also recorded in the draft of the new edition of the CPSU Program.

Inspections were organized in Bryansk, Vitebsk, Gorkiy, Kaluga, North Kazakhstan and Chernigov oblasts. They were also motivated by local reports of a far from uniform increase in output, and even a sharp decrease following a slight increase in some places.

I would not like to begin this discussion with regrettable incidents. Especially in view of the fact that there are positive indications. On the Krasnoye Znamya Kolkhoz in Dokshitskiy Rayon in Vitebsk Oblast, for example, each of 250 farmsteads has a cow, they are fattening more than 600 pigs there and they have a herd of close to 200 sheep and many different kinds of poultry. The inhabitants of this Belorussian farm take their surplus to procurement agents instead of going to stores to buy food.

The situation is similar on the Kolkhoz imeni Zhdanov in Karachevskiy Rayon in Bryansk Oblast. Its workers provided the state with 54 tons of meat and 112 tons of milk--twice as much as in 1982. This is a perceptible increase.

[Question] But was there an increase in general in these oblasts?

[Answer] This is precisely what is lacking. Bryansk Oblast bought an average of 63,000 tons of meat and 291,700 tons of milk from private farms each year

from 1976 to 1980. Since 1981 there has been a respective decrease of 5,500 and 24,400 in these figures. The same decrease has been recorded in Vitebsk Oblast.

A decrease in procurements of meat from farmsteads was discovered in all of the oblasts inspected, and a decrease in milk procurements was discovered in five out of six. Only North Kazakhstan Oblast displayed what zootechnicians call an advantage--102 percent. On the other hand, the meat procurements, which had amounted to only 31,000 tons earlier, decreased by 14 percent.

[Question] But the decrease in procurements could also be due to the inefficiency of procurement agents. The editors of SELSKAYA ZHIZN have received several reports of such incidents from readers.

[Answer] The inspection proved that this was not the main problem. The herd of livestock on private farms has been reduced. There are now 12,000 fewer privately owned cows in Bryansk Oblast, 5,000 fewer in Vitebsk Oblast and 16,000 fewer in Gorkiy Oblast. The herd of pigs was also much smaller in four of the six oblasts inspected. There were 15,000 fewer pigs in Gorkiy Oblast. Incidentally, there is not one rayon in this oblast where a radical decrease did not take place.

On the Priokskiy Sovkhoz the herd of privately owned cattle decreased to one-fifth of its previous size over a period of 5 years--there are only seven calves and one piglet for each 100 farmyards! Pens are empty. But people cannot live without meat and milk. Where do they get them? From the public supply. They reduce the supply instead of adding to it.

[Question] Were the people's controllers able to learn the reasons for the reduction of the herd on private farms?

[Answer] Of course. At the beginning of our talk I mentioned the Kolkhoz imeni Zhdanov in Bryansk Oblast, where procurements of animal husbandry products from the population had increased perceptibly. The main difference here is the concern of farm managers about the private farmyards of rural workers. Just last year they sold them 22 heifers and around 1,000 piglets. They took feed, and not meat and milk, from the public supply.

Now we will consider some other facts. Even the official assignments for the sale of young livestock to the population are not being fulfilled in all of the oblasts inspected. On the Mirovoy Oktyabr Kolkhoz in Arzamasskiy Rayon in Gorkiy Oblast, for example, there is a large pig farm, but only 247 piglets were sold to kolkhoz members in the first 6 months of this year. And there are 2,339 private farmsteads here! Furthermore, the livestock sold are usually substandard.

The situation with regard to the sale of young poultry is no better. Last year the population of 6 of 24 rayons in Bryansk Oblast was sold 470,000 fewer head of poultry than planned.

[Question] Viktor Aleksandrovich, many letters to the editors complain about difficulties in acquiring feed for even the existing livestock on private

farmsteads. It is for this reason that people do not even want to keep poultry.

[Answer] The inspection corroborated this regrettable fact. Local agricultural agencies and soviets and the managers of kolkhozes and sovkhoses frequently do not display the necessary concern about feed for livestock in the private sector. The plots allocated for grazing and for hayfields are usually unproductive. Even when sovkhoses and kolkhozes have a good feed supply, they sell much less to their workers for private plots than the quantities stipulated in the industrial and financial plan.

The wanton misuse of mixed feed allocated to the consumer cooperative network is still being practiced. Instead of selling it to the population in exchange for meat, the network sells the feed to other organizations or uses it for its own needs. This arbitrary practice was discovered in Chernigov, Vitebsk and other oblasts.

In most cases, the population is not given the necessary help in grazing livestock. Not all kolkhozes and sovkhoses exercise their right to assign herdsmen to the private sector. People have to take turns watching the herd, taking time off from their jobs. Veterinary services for private farmsteads are also badly organized.

[Question] These facts do not tally with the direct benefits the kolkhozes and sovkhoses can derive from these farmsteads: After all, they have the right to buy animal husbandry products from the population to fulfill their own procurement plans.

[Answer] This is precisely where the farm managers do not miss a trick. They buy milk, meat, wool and other such products quite vigorously. And they are not embarrassed by their failure to give the citizens the necessary, state-prescribed assistance. In some places the products procured from the population even cover production shortages. This is how farms in North Kazakhstan Oblast secured the entire increase in milk procurements for 4 years of the five-year plan.

I would like to end our discussion with the conclusion the Committee of People's Control drew from the results of the inspection: All of these shortcomings are largely due to the fact that local agricultural agencies and soviets have relaxed their efforts to develop the private farming sector and are not establishing favorable conditions for the augmentation of the number and productivity of livestock.

8588

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AGRO-ECONOMICS AND ORGANIZATION

USE OF FAMILY CONTRACT SYSTEM ADVOCATED

Moscow SELSKAYA NOV in Russian No 10, Oct 85 pp 8-9

[Article by G. Shmelev, doctor of economic sciences: "The Family Accepts a Contract"]

[Text] On two high-mountain Georgian sovkhoses, combining the inhabitants of the villages Ushguli and Ipari, which are situated in the austere region of Upper Svanetiya at an elevation of 2200 meters above sea level, an experiment on introducing the family contract has been conducted since 1983 with the support of the CP of Georgia Central Committee.

Why did they decide to carry out the experiment precisely here?

A considerable portion of these sovkhoses' usable lands consists of mountain pastures and haylots. There are no roads leading to them. Fodder has to be prepared by hand, and oxen serve as the principal traction force. Winter in Svanetiya lasts for more than seven months; snow often falls as early as the end of August.

It should come as no surprise that under these conditions labor productivity was low, production was unprofitable, and the wages of many of the sovkhos workers amounted to only 50--60 rubles a month. But, you know, the mountains are a major reserve for developing this republic's agriculture, inasmuch as the plateau expanses are already mastered and inhabited.

According to the experiment's authors, the family contract should alter the unfavorable economic and social situation in the mountain regions.

In making the transition to a contract, each family was assigned sovkhos livestock, pastures, and haylots. It was provided that production output would be sold to the sovkhos at prices not to exceed the state requisition prices. For their part, the sovkhoses pledged to provide free agro-veterinary service for the livestock, offer to those families working on a contract basis agricultural equipment and other means of production at merely the cost of these services, and to sell them at state prices building materials, mixed feeds, mineral fertilizers, herbicides, and pesticides. Taking into account the possibilities and the wishes of the families, they were assigned an average of three or four head of cattle each from the public herd.

It must be said that the inhabitants of the mountain villages have readily taken advantage of the chance to make the transition to the new form of organization and wages. As early as the following year after the experiment's beginning the overwhelming majority of the families (411 out of 479 enrolled in the sovkhoses) were working on a contractual basis.

But what has the transition to a family contract produced? Production output has noticeably increased. If both sovkhoses had previously been operating at a loss, they finished up 1984 with a modest-sized profit. The average weight of the livestock sold to the state increased from 236 to 295 kilograms at the Ipari Sovkhoz, and from 253 to 310 kgs. at the Ushguli Sovkhoz. In 1984 not a single case of cattle plague was registered, nor was there any mandatory slaughter of the public livestock, which had previously been a genuine calamity for these farms. With the transition to the family contract, the organizational-economic structure of the sovkhoses became simpler: departments and brigades were eliminated, and this permitted the staffs of administrative-management personnel to be reduced for both sovkhoses by more than 50 persons.

All of this could not fail to have an effect on wages: on the Ushguli Sovkhoz they increased during a year's time from 94 to 165 rubles, while on the Ipari Sovkhoz they went up from 75 to 121 rubles. Employment of the population in public production grew; pensioners and students began to take part in it more actively.

Although it is still too early to sum up the final results of this experiment, some of its positive results are now available. It was decided to begin next year extending the family contract to all the farms of the Mestitskiy and Lentekhskiy Rayons of Georgia.

The following question arises: why was such an effective form of labor organization not developed here earlier? The main reason, perhaps, is inertial thinking, the idea of a family contract as something obsolete, not up-to-date, and even, in general, as something inappropriate for socialist production relations.

In this connection, I would like to cite a statement by the chairman of Georgia's State Committee of Agricultural Production, G. D. Mgeladze. In a book recently published by Politizdat he writes as follows: "I have had occasion to hear more than once, and I am sure that I will hear again, retorts by excessively cautious opponents, who see everything through the prism of the notorious saying 'whatever will come of this?' Here is what, they say, has already come of this: the leader of this republic's agriculture is calling for just about the dissolution of kolkhoses and sovkhoses. To such 'hard-rock Marxists,' as V. I. Lenin scornfully termed such dogmatists, I would like to say the following: is it really true that depopulated mountains, millions of rubles in losses, and shortfalls in meat and milk amounting to thousands of tons are worth clinging convulsively to for the sake of a form of production which does not justify itself under the given specific conditions? All the more so in that the new production relations fully correspond to our socialist principles...!"

Stated heatedly and sharply, but justifiedly.

That which was created in the sovkhoses of Georgia's Mestiyskiy Rayon, where the public herd and agriculturally suitable lands have been almost completely assigned to families and where the intra-farm structure has been reorganized is only one type of family contract. In practice other forms of it are encountered more frequently, for example, the raising of a portion of the young stock from the public herd and poultry on people's own farmsteads according to a contract. Moreover, this has not led to any restructuring of the farm. It is also a variety of the family contract.

In certain cases the livestock being transferred to a family contract are maintained not in the private barnyards but rather in the livestock-raising areas of the farm. For example, a modest-sized farmstead on the Luunya Sovkhoz, Tartuskiy Rayon, Estonia, was transferred to a family contract. It has several dozen cows and is equipped with a milk pipeline, a conveyor for collecting and removing manure, an automatic drinking trough, a refrigerator for the milk; it also has a fenced-in pasture adjoining the farmstead. This farm is serviced by a family consisting of two workers, one of whom is a machine-operator who has a tractor at his disposal.

The family contract has become widespread in the country's southern regions, where nomadic sheep-raising is engaged in. It predominates as a form of labor organization in the raising and fattening up of mulberry silkworms. In Armenia the family contract has received its "stamp of approval" at several poultry plants belonging to the system of Ptitseprom [Poultry-Raising Industry Administration]. It is being adopted in viticulture, tobacco-growing, sheep-raising, in cultivating fruits and berries, and on beet plantations.

A family contract can be based on the use of resources from the public farm or those of the private, subsidiary farmstead. It can encompass the entire cycle of production or merely certain of its stages: let's say, for example, the weeding and harvesting of the crop. It can include, in addition to family members living together, relatives who are city-dwellers; it can be performed by members of one family as well as on an inter-family basis, during working hours as well as in leisure time.

In the Bulduri Sovkhoz-Tekhnikum, Latvian SSR, for example, there has been a transition to the family contract in the growing of carrots, which are supplied to this republic's capital. Land has been assigned to groups comprising 15--30 families, unique mini-cooperatives which are formed, primarily, of workers in one field of specialization (e.g., milkmaids or machine-operators). By means of casting lots, the land is distributed among the families, as calculated on the basis of 0.1 ha per person. The mini-cooperatives are headed up by managers who are appointed by the farm administration. On an average, one family turns over 3--4 tons of produce and receives a monetary income amounting to 1500--2,000 rubles.

On certain farms of Osh Oblast, Kirghizia, the family contract has become widespread in the production of alfalfa seeds. This form of labor organization has proved to be particularly effective in sowing and harvesting crops. For example, A. Yakubdzhanov's family unit from the Uzgen Sovkhoz in 1984 obtained 7.44 quintals of conditioned seeds from the section assigned to it.

Nor must we fail to mention that, under the family contract, a simple, easily understood system of wages is adopted. Thus, sheep-herders are assigned a task regarding the average 24-hour weight gain, wool-shearing, and obtaining offspring per sheep and for the herd as a whole. There are no confusing or unclear indicators. The more output is produced--the higher the wages.

If an attempt is made to provide a general definition for all these various forms of the family contract, it can only be stated that it means the utilization in agriculture of the family's labor resources in the interests of public production, on a contractual basis and with wages keyed to the end-result of output.

Here it is entirely justifiable to suggest an analogy with the collective contract. Indeed, the family is a small collective, a family unit. When assigned to a family, the land does not change its owner; it remains the property of all the people in common. The labor of those persons working on a family contract is an inalienable part of the labor within public production. It is encompassed by integrated planning and is carried out on the basis of contracts concluded by the families with the public farm. The connection with public production and its results becomes even more tangible and direct, inasmuch as the families which have made the transition to a contract share with the kolkhoz or sovkhoz not only income but also production risk and, consequently, the losses as well. Under the family contract there is an organic combination of personal, collective, and common national interests. Socialist competition can be developed among those families which have accepted contracts, and this is being done, for example, on those same sovkhozes in the Metiyskiy Rayon.

All of this testifies to the fact that the family contract has the same general principles as the collective one. It is not in opposition to the collective contract but is rather a component part of it, a supplement. There are no grounds whatsoever for considering the family contract as some kind of organizational form which is isolated from the collective and which allows the predominance of personal interests over communal ones.

It is another matter that, because of a lack of attention to the family contract, it remains a "neglected child" within the organizational-economic structure of agriculture. And, as quite frequently happens in the case of children who are deprived of care by their parents, they do not turn out entirely as they should with proper upbringing, that is to say, with attention and supervisory control.

It is precisely as a result of the "semi-legal" existence of the family contract that instances occur whereby clever brigade leaders, acting as middle-men, make it their concern to "come to an agreement" with a kolkhoz chairman or a sovkhoz director, secure extortions from those persons desiring to work on the basis of a family contract, and, in turn, attempt, sometimes successfully with the help of underhanded tricks, to obtain permission to assign lands to families. All of this could be avoided if the family contract were finally to be given legal status, if it became the object of public initiative and public monitoring controls.

Up to now we have been speaking about the family contract as a form of small-group labor organization in agriculture. However, the utilization of families' production potential can be broader. The newspapers report such local initiative as rural families taking charge of certain sections of small rivers: families living close to the rivers are taking responsibility for arranging the banks, maintaining the landings, and clearing out the channels.

And why not use this form, for example, in the forestry of mountain regions, assigning to certain families scattered along the forest cordons of small settlements sections of forest for caring for them and cultivating the forest?

Here and there in small villages trading posts are being set up in homes on a contractual basis. In Lipetsk Oblast, for example, upon the oblispolkom's decision, the consumer cooperative opened up several dozen stores (by the end of the current year there will be more than 100 of them) in remote, sparsely populated points; these stores are located in the vacant rooms of apartments and on verandas, and they deal in packaged food items, various household articles, and implements. The salespersons in such stores are housekeepers, pensioners, and milk collectors. The homeowners receive payment for leasing the areas and for their work in selling the products. Pilot stores provide these mini-branches with goods, which are shipped in two or three times a week. It is assumed that the annual turnover of these trading posts will exceed 2 million rubles.

It must be noted that in certain socialist countries the family contract is being used quite widely in the agrarian sector as well as in other spheres.

A great deal has already been written in our press about the Hungarian experience. Let me cite an example from Bulgaria's practice. Since the beginning of 1985, in accordance with the decision made by the Committee on Labor and Social Affairs and the National Agrarian-Industrial Union (NAPS) of Bulgaria, the contractual-job system is being introduced everywhere in the rural areas. Furthermore, within the framework of the production brigades use is being made of team, family, and individual contracts. The following data bear witness to the spread of the family contract in Bulgaria: approximately 94,000 families are working on a contractual-job basis in this country's agriculture. About 43,000 more persons are working on the basis of individual contracts. For the sake of comparison we should note that for all of 1983 there was an average number of 923,000 persons employed in Bulgaria's agriculture.

In all those countries which have adopted the family contract its economic effectiveness and social significance have been remarked upon: among the workers it increases the feeling of co-participation and responsibility for the state of affairs in public production.

But to return to our own country, a reproach for paying insufficient attention to the family contract should be directed not only at the farm managers but also at scientific organizations. The haphazard quality in developing the family contract is to be explained, in large extent, by the absence of any scientifically founded principles regarding its functioning. Up to now writers and publicists have done more to attract attention to the family contract than have scientists--economists, sociologists, and legal experts.

To be sure, the attitude toward family contracts has recently begun to change. The session which was held in May of this year of the Personal Subsidiary Farm Section of the Scientific Council on Rural Social Development, VASKHNIL [Academy of Agricultural Sciences imeni V. I. Lenin/ examined the problems of the development of the family contract as a form of small-group labor organization in agriculture.

Not everything has been profoundly studied here or thought through to the end. Material incentives, intra-farm relations in connection with introducing the family contract, its economic effectiveness--these and other questions require serious studies and experiments.

In speaking at a conference in the CPSU Central Committee on problems of speeding up scientific and technical progress, Mikhail Sergeyevich Gorbachev stated the following: "The main thing now is to mobilize organizational, economic, and social factors, instituting order, increasing responsibility and discipline, improving the organization of production and labor, in order to ensure the better utilization of all that the country has at its disposal. In each association and enterprise, in each production section, we need to determine those units where, with minimal additional funds, or even without them at all, we can obtain the best result."

Today one can already state the following with assurance: under certain conditions the family contract is an effective form of organizing and paying for labor, assisting the production of agricultural output, and successfully solving social problems. And the faster it acquires the "rights of citizenship," the better it will be for the cause.

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2384

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TILLING AND CROPPING TECHNOLOGY

INTENSIVE TECHNOLOGY IN URALS AND TRANSURALS EXAMINED

Sverdlovsk URALSKIYE NIVY in Russian No 8, Aug 85 pp 2-4

[Article by A. Osadchuk, chief, Main Administration for Zemledeliye [Crop Production], RSFSR MSKh[Ministry of Agriculture]: "Intensive Technology in Practice"]

[Text] The 26th CPSU Congress defined the main task in crop production as the general improvement in land fertility, further increases in the yields and production of grain, feeds and other output through the use of scientifically based farming methods.

In order to complete these tasks grain growers at kolkhozes and sovkhoses in Russia must annually obtain at least 20-22 quintals of grain per hectare from unchanging crop areas. This is totally realistic. Such yields are obtained every year at a large group of farms, many of which grow three and more tons per hectare. Even during the difficult conditions last year 5 percent of the kolkhozes and sovkhoses in the republic exceeded this. One out of 5 farms produced more than 2 tons per hectare. It is important to note that high yields of grain and other crops are attained by progressive farms in all krais, oblasts and autonomous republics. Here are specific examples:

The Uspenskiy Sovkhoz in Tyumen Oblast: During 1976-1980 here yields averaged 31.8 quintals per hectare, during 1981-1984 -- 37 q/ha, and last year they were 45.2 q/ha.

The Unysh Kolkhoz in Dyurtyulinskiy Rayon, Bashkir ASSR obtained 29.7 quintals of grain per hectare in the 10th Five-Year Plan, and 34.7 in the 11th, including 38.1 q/ha in 1984.

These and many other progressive farms produce crops on a genuinely scientific basis. This is the secret to the stability of their high results. Thus, crop growing collectives are capable of mastering more progressive technology. They have established the necessary basis for this and the required professional experience is available.

The mastery of scientifically based systems for crop production and the introduction of intensive technology are closely interdependent processes. The conversion to them is due to scientific and technical achievements in the

economy as a whole and agriculture in particular. The sufficient prerequisites for this conversion are now available. One of them is the stabilization of the structure of land use on a scientific basis. This will make it possible for farm agronomists to work on a long term basis, to attained planned increases in the fertility of each field and each plot of land. Most farms in the dry steppe regions have the optimal area of clean fallow. This is of exceptional importance for improving yields and reducing swings in the production of grain, feeds and other products. There has been a marked increase in applications of organic and mineral fertilizers to grain crops. In 1984 applications of industrial fertilizers totalled 4.4 million tons (active ingredients). This is 31 percent more than in 1980; applications of organic fertilizers amounted to 202.5 million tons, a 51 percent increase. Equipment is being ever improved and work loads reduced. For example, during this period the work load per grain combine declined from 175 to 141 hectares. The area planted to new varieties continues to expand. In 1984, 41 percent was planted to new wheat varieties, and 46 percent to new rye varieties. The new wheat varieties include Almaz, Bezenchukskaya 139, Saratovskaya 46, Omskaya 9 and other valuable varieties.

Naturally, all this creates new possibilities for farmers, making it possible to conduct operations at higher standards.

Since the beginning of scientific agronomy it has been known that the size of a harvest is determined by the minimum factor. In dry steppe regions this factor has always been moisture, the shortages of which limit increases in yields from all crops. The accumulation of moisture in the soil and the skill to use it rationally have been and remain the strategic basis for crop production in the steppe. The first is solved by fallow fields and tillage methods. The second by varieties, the regulation of mineral nutrition, and the protection of crops from disease and predators. One group of questions does not replace the other. They mutually support one another, and together have an effect upon yields.

This is why measures to increase the production of winter grains and high quality spring grains through intensification in the Volga region, the Urals, Siberia and Kazakhstan are oriented towards the planting of these crops following clean fallow in the first and second year of their use, towards supporting them with higher levels of mineral nutrition, and intensive protection from predators and diseases. The basic thought is to attain a guaranteed production volume of high quality grain on part of the area planted to food grains through the unification of all its components. For growers in Russia this means that 11 million hectares of such plantings must produce an additional 9-10 million tons of grain.

What are the ways of solving this task?

Above, all, the mastery of crop production systems must be accelerated at each farm. This is the key to a fundamentally new approach to this problem. Up until recently the development of such systems was restricted to large regions and it had a general and recommended character. They can become guideline systems for farm practice only if farm managers and agronomic services, with

the help of scientific and design organizations, elaborate them with regard to specific conditions at their kolkhoz or sovkhoz.

As is known, by 1986 it is planned to complete the development of scientifically based systems of crop production for the period up until 1990. All oblasts, krais and autonomous republics in the Urals have met the 1984 targets for their elaboration. However, the quality of the systems at a number of farms is low.

The most serious shortcoming of many systems is the underdevelopment of questions concerning humus balances. Scientifically based crop production systems and the attainment of Food Program targets and state orders for the delivery of agricultural products, both with regard to volume and assortment, should solve questions such as the preservation and improvement of land fertility, which depends to a great extent upon soil humus. At many farms in the Urals, Siberia and the Far East the humus balance is negative. In recent years this situation has become especially alarming at many farms in Kurgan, Chelyabinsk and Omsk oblasts and the Bashkir ASSR. Organic fertilizers are not applied at all to large areas of fallow here. In Kurgan Oblast only 15 percent of the fallow planted to crops this year received organic fertilizers, in Chelyabinsk and Omsk oblasts the figure was 16 percent, while in Krasnoyarsk Kray, and the Buryat and Tuva ASSRs it was 8-9 percent. In addition, manure is often applied only to fields located near farms, while distant fields do not receive it for years at a time. Naturally, the yields from such fallow fields are somewhat less than the norm. For example, in the Southern Urals, the norm for fallow planted to spring grain crops is 4.3 quintals, but in Orenburg Oblast the increment was only 1.3 quintals. Of course, drought has its effects here, but in Chelyabinsk Oblast, under the very same conditions, the increment was 5.7 quintals. It is during droughts that these increments are so valuable and fallow is so needed, because in many regions of the republic drought is a characteristic feature of the climate. However, returns from fallow depend not only upon methods of working it, but upon the application of organic fertilizers full of plant nutrition elements.

The content of organic substances in the soil becomes an especially important question when grain production is intensified. According to data from Academician I. S. Shatilov, even if plants are well supplied with mineral fertilizers, they nevertheless receive 50-60 percent of their nutrients through the soil's natural fertility, and in soils with less than 1.5 percent humus content it is not efficient to use mineral fertilizers, especially in large doses. At the same time, many farms do not have enough humus or peat to eliminate the humus shortage. In addition, as was stated, due to the lack of transportation, organic fertilizers are mainly applied to fields near animal farms, or devoted to produce and feed crops.

One of the solutions to this situation is to plant green manure crops, use straw as fertilizer and introduce perennial grasses into the crop rotation pattern (not in reserve fields!).

The Altay NII [Scientific Research Institute] for Crop Production and Selection is seriously studying the potentials for using green manures as fertilizer. The institute's scientists recommend sweetclover [Melilotus] as a

green manure crop. It is mulched and plowed under during the second half of June. Rape and pulse crops can also be used. Scientific research and production operations show that 3 tons of green manure, for example, wild cabbage, are equivalent to 1 ton of manure. A greater return is gained by plowing under lupin.

Taking all this into consideration, in March of this year, the MSKh RSFSR and the Russian Department of the Agricultural Academy imeni K. A. Timiryazev published an order [prikaz]: "On Expanding the Use of Green Fertilizers", which suggests to agricultural ministries of autonomous republics and agricultural administrations of krayispolkoms and oblispolkoms that in developing crop production systems for kolkhozes and sovkhozes, provisions be made to include green manure crops in the crop rotations. Such crops should be intermediate crops and and on fallow fields.

Straw, which is rich in organic material, is of great importance in increasing the soil's content of such materials: cellulose, hemicellulose, lignin and mineral compounds. However, straw does not have much nitrogen. The ratio of carbon to this element is 80-100 to 1. This delays the decomposition of organic substances. Microorganisms need nitrogen, taking it from the soil in ammonium and nitrate forms. In order to prevent this, many researchers recommend adding 8-10 kg of mineral nitrogen in each ton of straw, reducing the carbon/nitrogen ratio to 20:1 or 30:1, that is, approximating barnyard manure.

It is also advisable to jointly plow under chopped straw and green manures. The plowing under of green manure alone leads to the mineralization of nitrogen and its partial loss. At the same time, as was already said, the decomposition of straw intensifies the immobilization of soil nitrogen.

The struggle against wind and water erosion has a special place in the work to preserve and enhance the land's fertility. More than half of the arable land in Siberia, the Far East and the chernozem oblasts of the Urals are subject to wind and water erosion, including some which is potentially dangerous. Subsurface tillage should be used on 19.5 million hectares in this region, but in 1984 it was only used on 9.8 million hectares. Altay Kray and the Tuva ASSR use subsurface tillage on only 73-75 percent of the land for which it is intended; on farms in Irkutsk Oblast this figure is 26 percent, in Chita Oblast -- 35 percent and Kurgan Oblast 37 percent. According to averaged data, humus losses from erosion account for about one-third of all its losses.

The decline in nonmoldboard tillage which has started in recent years in some regions is also cause for concern. Equipment shortages are not the reason. It lies elsewhere: weed infestation at many farms is increasing because of low standards for soil tillage. This is a very acute problem and requires immediate action.

Agronomists know that one kilogram of weeds (in terms of dry organic matter) requires more moisture than many crop plants. Weeds take huge amounts of nutrients from the soil. Naturally, weed infested fields must be fought with a very strict system. Many farms do not do this. Herbicides are often applied without studying the species composition, application times are not observed.

etc. BIG-3 needle tooth harrows [igol'chatyye borony] are poorly utilized in the struggle against weeds. In addition, working the stubble with these harrows assures the simultaneous sprouting of wild oats, Tatar buckwheat, and other annual weeds.

Many specialists hold to the opinion that the expansion of soil protection technology is delayed by a shortage of nitrogen fertilizer. They should understand that continuing to till the soil by moldboard techniques is to loose it, and nitrogen, by wind and water erosion. It is known that compared to ordinary tillage methods, soil losses from erosion are two fold less when soil protective technology is used. In any case, if all other conditions are equal, farms which have really mastered soil protective technology are always at an advantage. According to SibNIISKhoz [Siberian NII for Agriculture], the use of soil protective technology in the steppe regions of Omsk Oblast increases grain yields by 4.4 q/ha. This is not only a momentary advantage, as this technology also helps preserve soil fertility for the future.

The mastery of scientifically based cropping systems and the widespread introduction of intensive technology for grain growing put special importance upon the use of mineral fertilizers, and especially upon application methods. Numerous studies and extensive production practice convincingly show that local applications have an indisputable advantage over the broadcast method. This is not all. Application depth of the main dose and the amount of phosphorus are also important. Preplanting fertilizer application is relatively well developed for dry steppes in the Urals and Siberia. No more than 30 kilograms of active ingredients per hectare should be applied at that time, when doses reach 60-80 and even 100 kg per hectare they should be applied in the fall or on fallow (or on fields following it) at the depth of the most active root layer (from 6 to 16-18 cm) so that they will be where there is moisture. When the upper layer of the soil dries out rapidly plants can not assimilate more than 20-30 kg of fertilizer per hectare, the rest will not be utilized.

As farms do not have enough GUN-4 special machines for the deep application of fertilizer, attention should be directed to the experiment in fertilizer application using the SZS-2.1 grain drill equipped with special applicators developed by the Bashkir SKhI and improved by the Altay Kraysselkhoztekhnika, SibIME [Siberian Institute for the Mechanization and Electrification of Agriculture] and SibNIISKh. In their selection consideration should be given to the specific conditions at each farm, the type of tillage, the availability of soil moisture, etc. However, the main goal should be pursued: applying the fertilizer in the moist layer in accordance with the biological requirements of plants and preventing soil dry out.

The purpose of intensive technology is not only to increase yields, but to improve grain quality. In 1984 many farms in Siberia did a good job in improving grain from strong wheat varieties and met the plans for their delivery to the state. Farms in Altay Kray alone delivered more than 400,000 tons of strong varieties and more than 600,000 tons of high grade [tsennyy] wheats, while in Omsk Oblast the figures are 413,900 and 322,900 tons. Kolkhozes and sovkhoses in Novosibirsk Oblast also fulfilled their plans for grain sales to the state. Unfortunately, because of severe drought, strong

wheat sales plans were not met by farms in Orenburg and Chelyabinsk oblasts and the Bashkir ASSR. Moreover, they did not take advantage of all their possibilities of increasing this grain's sales volumes. Thus, farms in Orenburg Oblast sold the state about 360,000 tons of wheat with an average gluten content of 31 percent and more. They sold only 2,000 tons of grain meeting the standards for strong wheat. Orenburg farmers sold 100,000 tons of high grade wheat. If there had been more careful selection of groups a sizable share of this could have been strong wheat.

The durum wheat situation is very strained. For a long time farms in the Urals and in Siberia have not met their production and procurement plans for this kind of wheat. Kolkhozes and sovkhoses in Orenburg and Chelyabinsk oblasts, Atlay Kray and the Bashkir ASSR are in especially great debt to the state. Of course, durum wheat is a more demanding crop. It has lower yields, but is very much needed by the national economy. Special attention should be given to its production.

Durum wheat should only be planted after clean fallow. Its seed growing must be decisively improved. Scientific institutions have a great role in this. Can one tolerate a situation where, year after year, elite seed delivery plans are not met by the Orenburg NIISKh, the YuzhUralNIIZ [Southern Urals NII for Crop Production], the Bashkir NII ZiS [Possibly NII for Crop Production and Seed Growing] and other scientific institutions?

This year, using the increased possibilities for fertilizer application and integrated pest management, agricultural organs, managers and specialists at farms in Siberia and the Urals must raise grain quality improvement work to a new and higher level.

The mastery of intensive technology also requires improvements in the professional knowledge of specialists, who must perfectly know the biological qualities of crops and work with them at levels appropriate to the latest scientific achievements. Systematic observation of the stages in plant growth and development, and of agrometeorological and ecological situations will make it possible to select the most effective solution. However, this requires knowing in what phase, or more accurately in what stage, of organogenesis various elements of productivity are formed.

I want to stress that many agronomists often underestimate the importance of the main nutrients arriving at the various stages of organogenesis, when shortages of them at the necessary time cannot be compensated for in subsequent periods. It is sometimes overlooked that at the X stage of organogenesis, for example, the productivity of photosynthesis increases sharply, determining grain size and filling. This process is primarily .PA determined in the upper leaf, especially in the topmost leaf, the flag. About 64 percent of the total flow of assimilants comes to the grain from there. If the upper leaf is injured or destroyed the grain grows poorly. Rusts, septoria and other diseases, which can negate all the efforts by grain growers, appear.

Only by thoroughly knowing the biological qualities of grain crops, the duration of stages, and the times and meteorological conditions of their onset,

can specialists establish at which of them and through what elements of productivity is there the greatest yield losses and quality deterioration.

In addition to this, attention should be directed to crop location conditions. This requires that each farm field have an agrochemical and plant protection description which indicates the type and density of weed infestation, the amount of plant pathogens, the presence of nutrients, etc. Only then will it be possible to intelligently compile a technological chart.

Agronomic improvements in growing corn for grain in the waxy stage and in the milky-waxy stage for silage require special examination. Methods have been developed for chopping and preserving corn ears to produce a high energy feed for hogs and cattle. However, in recent years farms in Siberia, the Urals and the Far East have raised practically no corn using grain technology: with seeding norms of 80-100 kg per hectare, only leaf and stalks are obtained for silage. In justifying this there is often reference to the danger of reductions in planting norms leading to very thin stands and an overall loss of dry matter per unit of area. However, thin stands are more often due to the cutting of plants during cultivation. If this work is delayed the fields become weed infested. This problem is well solved by the Astrakhan industrial technology for growing row crops

Farms in Siberia, the Urals and the Far East have large reserves for improving the efficiency of agricultural production. It is their duty to completely put these potentials at the service of the harvest and the successful solution of the country's Food Program.

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TILLING AND CROPPING TECHNOLOGY

NEW CROP PRODUCTION TECHNOLOGY IN KURGAN OBLAST

Moscow PRAVDA in Russian 31 May 85 p 2

[Article by A. Ustyuzhanin, council chairman of Kurgan Oblast Agro-Industrial Association, under "Agroprom: Reserves for Economies" rubric: "New Technology"]

[Text] Wheat fields in Kurgan Oblast occupy 1 million hectares. On more than half of this area farmers have mastered intensive technology. Thanks to this it is planned to increase the gross harvest of grain by 300,000 tons. This is not an easy task. After all, the Transurals is an area of droughts. The soils are heavy and heat up slowly. The frost free period is only about 100 days.

It is therefore probable that in other departments opinions have been expressed as to whether or not it is worth it to deliver fertilizers or other resources here. Isn't there a risk? However, Kurgan farmers have shown how rich the land can be if it is skillfully approached. We harvest 30 and more quintals of grain per hectare following fallow. If fertilizers are applied the yields rise another third.

What about the Maltsev system of crop production. It has become the basis for many zonal systems. Methods for accumulating and using moisture, fighting weed infestation, the use of nonmoldboard tillage, clean fallow and other tested agronomic measures have completely proven themselves. Now we have intensive technology. The oblast's farmers are ready to master it. The grain sector's potentials are such that the new methods should give sizable returns.

What is the basis for this confidence? Fallow has been increased to the optimal levels. All the seed prepared is strong and high grade [tsenny] varieties, mainly of local selection, including two new ones: Kurganskaya-1 and Kurganskaya-2. They are drought resistant, with short vegetative stages and yields of 50 and more quintals.

We had to reexamine and refine many agronomic measures. Grain growers planned to obtain high quality grain. Serious, well based corrections were made in the plans for applying fertilizers and using herbicides.

Production organization is changing. Ten agrocomplexes were developed. Here is one of them, intended for 26 farms in the southern zone. Initially at the Berezhovskiy Sovkhoz they started raising grain crops by intensive technology on soils subject to wind erosion. An experimental point for the VNII [All Union Scientific Research Institute] for Grain Growing was established. During the first years the results were startling: yields increased 1.5 fold, then, due to bad weather they declined by 20 percent at farms in the region. Success was assured by an entire complex of measures: strip fallow, subsurface tillage, using stubble drills for planting. They also succeeded in converting to wide sweep equipment and energy saving machinery. Fuel and labor outlays declined markedly and the profitability of grain production rose 35 percent.

The system of agrochemical support to the crop rotation pattern is calculated to obtain high gluten grain. Farms which have used scientific recommendations are gathering about 20 quintals of grain, while the other farms only get 13. However, these "others" are in the majority.

As can be seen, the possibilities for accumulating moisture are unequally used. True, there are farms where lagging is due to shortages of certain resources, however, there are not many of them. Their weak economies are mainly due to unskilled leadership and low standards for crop production.

Intensive technology requires experience and highly qualified personnel. Courses and schools for the study of new methods have been set up at institutes and tekhnikums. Farm and agroindustrial association managers, agronomists and machinery operators are trained there. It is now important to see that the knowledge obtained brings practical returns.

Grain growers at the Kolkhoz imeni Kalinin in Shumikhinskiy Rayon are among those successfully using intensive methods. The land there is very fertile and yields are 1.5 fold higher than those of their neighbors. Field workers at the Sadovoye Experimental Farm, the Rechnovskiy Sovkhoz and the Krasnoye Znamya, Zarya and Rossiya Kolkhozes are working skillfully. They are located in different zones, but intensive methods are always effective.

The sector's intensification requires more careful preparation of equipment. As is known, work volumes are increasing. However, there is another side to the matter. Additional passes of equipment usually reduce moisture reserves in the soil. To prevent this a lot of skill is required of machinery operators.

To whom the new matter is entrusted is also quite important. Almost half of the arable land here is under the guardianship [opeka] of contract collectives. Contracts and cost accounting targets are made more accurate. It is often necessary to break old habits. For example, crop rotations are now attached to brigades for long periods. We plan to extensively use the flow line-cycle method of equipment operation, which permits more effective equipment and labor resource utilization. What has this done? During harvest the Progress Sovkhoz usually invited hundreds of people from the outside. In the past two years, after introducing the flow line-cycle system, the sovkhov is getting along with its own resources.

The new technology makes increased demands upon labor and executive discipline. This applies not only to farmers, but to their partners. For example, oblselkhozkhimiya [Oblast agricultural chemicalization] enterprises now give special attention to the treatment of fallow fields.

Farmers count on receiving specific help from Selkhoztekhnika workers in the modernization of machinery and attachments for intensive technology. Industry is still not meeting grain growers' requirements for such equipment.

It is time to be concerned about the reliable preservation of the future harvest. Above all, this is the obligation of grain products enterprises. Special emphasis is upon the procurement of strong wheat. In previous years grain growers and procurement workers have often disputed product quality. If the matter were intelligently organized and there were skillful cooperation between farms and procurers they could get along without conflicts. Enterprises in the Ministry of Procurements have a powerful base and modern drying facilities capable of processing the entire daily flow of grain. Farms, however, do not have this equipment. Often they are compelled to haul grain with increased moisture content, which has not been conditioned. Otherwise there would be losses. After all, the harvest, as a rule, does take place in autumn. In order to increase the mutual interest of farmers and procurers, the RAPO has regulated the procedure of payment for grain quality.

However, departmentalism still makes itself known. Certain ministries do not give complete consideration to grain growers' requests. Take, Minselkhoz mash [Ministry of Tractor and Agricultural Machine Building]. At times, its enterprises do not provide farmers with very much needed items. For example, the toothed harrow is in short supply. The remarkable Maltsev plow was created 30 years ago. However, even now, farms can not get it anywhere. Orders for many kinds of equipment are only 10 percent filled.

Machine builders have put RUM [Mineral fertilizer spreaders] production on line. Recently they created a new, even more powerful unit to hook up to the K-700 tractor. However, our kolkhozes and sovkhoses do not need such spreaders. Mechanics had to make applicator knives for grain drills from any kind of metal.

We know that scientists are the initiators of intensive technology's introduction. It appears that scientific institutions should give even greater attention to breeding drought resistant varieties of intensive types of wheat and to improvements in cropping systems.

The All-Union Scientific Conference on Problems in the Development of Crop Production met in Kurgan last year. Its participants noted the high efficiency of contemporary agronomic technology and acknowledged the need to improve it. We intend to firmly follow this course.

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TILLING AND CROPPING TECHNOLOGY

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INTENSIFIED AGROTECHNOLOGY IN NORTH CAUCASUS, CENTRAL CHERNOZEM

Krasnodar SELSKIYE ZORI in Russian No 7, Jul 85 pp 3-9

/Article by RSFSR Deputy Minister of Agriculture B. Martynov: "A Farming System for Each Farm"/

/Text/ 1. The 26th party congress and subsequent plenums of the CPSU Central Committee assigned large and important tasks to workers attached to the agroindustrial complex in connection with carrying out the Food Program based upon the accelerated conversion of agricultural production over to a scientific base and further intensification of all of its branches, particularly farming, which has been and continues to remain the key branch of agriculture.

The effective use of land resources and concern for constantly improving the fertility of soils -- these are two equally important tasks assigned to kolkhoz and sovkhos workers, scientists, specialists and all those who are concerned with the fate of the land and crops.

At the present time, all of the material and other requirements needed for carrying out this new stage in field crop husbandry have been created in the rural areas -- the conversion of each kolkhoz and sovkhos over to scientifically sound farming systems which are adapted to the local conditions and which take into account all of the peculiarities of a farm.

As a result of having mastered zonal farming systems, many kolkhozes and sovkhos, regardless of the prevailing weather conditions, are annually obtaining high and stable yields for all of their agricultural crops. Thus, on the average for the 1981-1984 period, the Petrovskiy Sovkhos in Lipetsk Oblast obtained 28 quintals of grain per hectare, the kolkhozes Novaya Zhizn in Belgorodskiy Rayon in Belgorod Oblast -- 31.2, Krasnyy Kavkaz in Baksanskiy Rayon in the Kabardino-Balkar ASSR -- 52 and Kazminskiy in Kochubeyevskiy Rayon in Stavropol Kray -- 44, the sovkhos Gigant in Rostov Oblast -- 32.1 and Dubovoye in Tambov Oblast 35.5 and farms in Mozdokskiy Rayon in the North Osetian ASSR -- 30.5 quintals per hectare.

The development and mastering of farming systems on each farm is a basically new approach for the introduction of scientific achievements into production operations. Up until recently, the development of these systems was limited to large regions. As a result, the documents served only in the capacity of recommendations. Today, in keeping with the specific farming conditions at a

kolkhoz or sovkhoz, they are serving as a guide for the carrying out of practical operations on the farms.

The development and mastering of systems on the farms are carried out by the leaders and specialists under the direction of local agricultural organs. The initial material is prepared by the planning institutes for land management, their branches and research expeditions, which are the general executive agents for the basic materials, the scientific-research institutes of agriculture, planning-research stations for the use of chemical processes, plant protection stations and NOT /scientific organization of labor/ centers. The plans call for the development of farming systems for the period up to 1990 to be completed next year. Last year they were composed for 609 kolkhozes and sovkhozes in the North Caucasus and central chernozem zone and this year they are being prepared for 1,660 more farms.

However, a selective examination of systems prepared for the Elektrosila Kolkhoz in Vyselkovskiy Rayon in Krasnodar Kray, the Sovkhoz imeni Lunacharskiy in Rostov Oblast, the Veduga Kolkhoz in Semilukskiy Rayon in Voronezh Oblast and a number of other farms has shown that in many instances the quality of the documents is not in keeping with the production requirements and does not conform to the methodological instructions for preparing them. The systems are overloaded with general recommendations and they lack proper coordination with the specific tasks of the Food Program and local soil-climatic conditions.

In many oblasts, krays and autonomous republics, the agricultural organs have remained aloof from the preparation of systems, preferring instead to turn this work over to the planning institutes of Roszemproyekt. This is precisely what happened in Rostov Oblast, the Kabardino-Balkar ASSR and in a number of other areas. And if the systems were prepared in a low quality manner, then there is little reason to expect an improvement in the effectiveness of farming during the course of their being mastered.

2. What type of unique agronomic regulation should we have that could serve as a reliable aid in the campaign to increase the productive power of the fields?

In the section entitled "Characteristics of Land Utilization," importance is attached not only to providing an agroclimatic description based upon those principal factors which determine the growth conditions for crop productivity, but also to pointing out the principal trends for the effective use of land, while taking into account the peculiarities of the relief and the soil and plant cover. The systems must be of a soil-protective nature in practically all areas. However, the agricultural organs, planning organizations and farm leaders and specialists are not attaching proper importance to their use. This applies first of all to the autonomous republics of the North Caucasus, where 18 percent of the arable land is subject to wind erosion and 15 percent to water erosion.

It bears mentioning that on farms in the North Caucasus and Central Chernozem Zone approximately 30,000 hectares of land included in field crop rotation plans are not being used for sowings. Six thousand hectares alone are being used for useless purposes.

The rates for the recultivation of lands, the soil cover of which was disrupted during the working of mineral deposits, have increased somewhat in recent years. However, the areas requiring restoration continue to be quite large in both zones. This applies in particular to Kursk (12,000 hectares) and Rostov oblasts (4,500 hectares), Stavropol Kray (4,200 hectares) and many others. Quarries and dumping grounds constitute a large portion of this land. Located as a rule on crop rotation fields, they seriously impede the work of the farmers.

In the magazine SELSKIYE ZORI (Issue No. 3 for 1985), scientists of the Kursk Agricultural Institute quite properly raised the question concerning the need for expanding considerably the use of the fertile layer of soil removed for the purpose of improving low productivity through the hauling in of soil. At the present time, the dumping grounds in the North Caucasus contain 22.8 million cubic meters of valuable chernozem soil and those in the Central Chernozem Zone -- 20 million cubic meters. In Belgorod Oblast alone, there are 10.9 million cubic meters and in Stavropol Kray -- 11.3 million cubic meters. Large supplies of fertile soil are to be found in Rostov Oblast. The resources of industrial ministries and land reclamation organizations must be employed in a more active manner in the restoration of lands and in improving low productivity lands and small quarries which occupy only small areas should be recultivated using farm resources.

The section entitled "Modern Status of Agricultural Production and the Prospects for Its Development" should provide not only a general description for the production of farming and livestock husbandry products, but in addition it should also outline those factors which can lead to an increase in the yields for all types of products. Moreover, it should define the general line to be followed by the farms in carrying out the Food Program. The strongest factors for bringing about an increase in production must include: irrigation, the use of intensive and industrial technologies, the conversion over to soil-protective methods of land cultivation and, certainly, the mastering of crop rotation plans. It must also reflect measures aimed at expanding the sowings of corn, sorghum, alfalfa, pulse crops and rape.

Considerable importance is attached to the section entitled "Measures for the Development of New Lands and for Improving Agricultural Lands." An analysis of the plans for land management reveals that despite the high level of plowing being carried out in the territory reserves are still available in both zones for increasing the amount of arable land. However, these tracts are being placed in operation only slowly.

Random checks have shown that of the land management areas called for in the plans at 37 kolkhozes and sovkhoz in Dagestan, 8,000 hectares have still not been developed and at 220 farms in Krasnodar Kray -- more than 22,000 hectares. A similar situation prevails in other oblasts and autonomous republics. The agronomic and land management services must restore order in this work, maintain strict accountability for each hectare and ensure highly efficient use of the land. A leading section is the one entitled "Structure of the Area Under Crops, Crop rotation Plans, Soil Cultivation Systems and Machines." In the course of developing scientifically sound farming systems for the oblasts, krays and autonomous republics for the 1981-1985 period, the agricultural

organs and scientific institutes carried out a great amount of work in all areas in connection with improving the structure of the areas under crops. The optimum dimensions for the chief components for the structure of the areas under crops (clean fallow, grain fields and the forage group) were defined for the republic as a whole and for the economic regions. Unfortunately, this structure is not always being maintained. In Voronezh, Rostov and Kursk oblasts, the grain crop areas were reduced in size compared to those called for in the systems and this brought about a drop in the production of grain and other farming products.

In many regions, solutions have still not been found for a number of problems associated with effective methods for carrying out the principal soil cultivation operation. This applies first of all to soil-protective cultivation. As a result of dust storms in the autumn of 1983 and during the winter and spring period of 1984, portions of the territory of Krasnodar and Stavropol krais and Rostov Oblast, in the face of insufficient soil moisture over considerable areas, sustained damage to winter crop and perennial grass sowings and on some tracts the fertile layer of soil was swept away.

Unfortunately, the scientific institutes have not taken a firm position in solving the tasks concerned with expanding soil-protective farming, although the experience of many leading farms reveals the clear advantages of non-mouldboard cultivation compared to traditional plowing.

By way of an example, I would like to cite the Kolkhoz imeni Lenin in Novokubanskiy Rayon in Krasnodar Krai, the lands of which are located in the Armavir "Corridor." Last year, notwithstanding strong winds during the January-April period, the velocity of which reached 25-30 meters per second, an average of 40 quintals of winter wheat, 45.3 quintals of winter barley, 28.3 quintals of peas and 42.6 quintals of corn for grain were obtained here per hectare as a result of soil-protective farming.

Work has been completed in regions of the RSFSR on the development of general plans for the use of anti-erosion measures during the period up to 1990 and into the distant future. The volumes of soil-protective farming called for in these documents should be reflected in the farming systems and should be introduced into kolkhoz-sovkhoz production in the near future. Special attention should be given to contour farming at kolkhozes and sovkhozes in the autonomous republics of the North Caucasus.

With regard to the section entitled "System for Raising the Fertility of soils," it bears mentioning that the foundation for stable farming has been and continues to be systematic work aimed at carrying out a comprehensive program of measures for raising the fertility of lands.

In the section entitled "Land Reclamation," attention must be concentrated on raising the effectiveness of an irrigated hectare. It is known that 42 percent of the republic's irrigated arable land is located in the North Caucasus and Central Chernozem Zone. And in the future, the plans call for these areas to be increased to 2.3 million hectares by 1990, including an increase of 315,000 hectares during the 12th Five-Year Plan. Large regions of irrigated farming based upon the modern achievements of scientific-technical progress will be created. Thus considerable importance is being attached to ensuring that the irrigated farming systems are developed on a high level. As yet, however, such an evaluation cannot be assigned to them. Hence the

insufficient effectiveness of irrigated lands at many kolkhozes and sovkhozes. Meanwhile, the introduction of a scientifically sound farming system enabled the farms in Stavropol Kray, on the average during 4 years of the five-year plan, to obtain 61 quintals of feed units per irrigated hectare.

In connection with the intensive development of land reclamation work, a need is arising for developing more accurate methods for controlling the processes involved in the formation of a crop on renovated tracts, in the interest of achieving better utilization of the biological potential of crops. This is being achieved most completely through comprehensive regulation of those factors concerned with the vitality of plants, which makes it possible to obtain high yields in accordance with a program prepared in advance.

In 1984, the programmed cultivation of high yields of grain, vegetable and forage crops on irrigated lands was organized at 2,778 kolkhozes and sovkhozes in the Russian Federation on an area of 1,024,700 hectares, including in the North Caucasus -- on 317,500 and in the Central Chernozem Zone -- on 93,100 hectares.

The experience accumulated on a number of farms in the programming of yields reveals a high effectiveness for the use of this method. Thus the Severnyy Sovkhoz in Rostov Oblast, as a result of the programmed cultivation of corn under irrigation conditions, is annually obtaining more than 100 (103-112) quintals of grain per hectare.

A large reserve for raising the yields is that of protecting the plantings against pests, diseases and weeds. Scientific studies have established the fact that, in the absence of annual protective measures, the grain crop losses caused by pests amount to 20-24 percent and those for technical, vegetable and fruit crops -- 30-34 percent.

Over the past few years, a considerable increase has taken place in the damage inflicted on grain crops in some regions of Krasnodar and Stavropol krays and Rostov Oblast by leaf beetles, grain sawflies and with increases taking place in the numbers of grain beetles, grain flies, aphids and leaf roller moths. Mouse-like rodents, locusts and chewing cutworms cause considerable damage to the crops each year.

Despite the importance of plant protection work, the requirements for pesticides, biological preparations, machines and implements for processing seed and crops and for applying preparations to the soil are not being determined in an accurate manner during the development of the farming systems. On the whole, the plant protection measures are prepared for a farm and not for crop rotation plans. Very little attention is being given to purposeful agrochemical measures aimed at lowering the amount of harm caused by specific pests and diseases.

Proper concern is not being displayed for organizing work aimed at combating grain crop diseases, despite the fact that powdery mildew, rust, septoria spot and root rot have spread out over considerable areas.

A pivotal element of scientifically sound farming systems is that of correctly organized seed production operations. In the section entitled "Seed Production

System," the principal problems concerned with the organization of seed production operations are set forth and the seed production and procurement volumes are provided. A central place has been set aside for seed production for grain crops and perennial grasses and for the development of organizational-economic measures for converting this work over to an industrial basis.

In recent years, production has been provided with many highly productive and intensive types of varieties having fine economically useful characteristics, varieties capable of furnishing 6-10 more quintals of grain per hectare compared to the standard. However, by no means is full use being made of this reserve in a number of regions.

The coefficient for the propagation of new grain crop varieties in Stavropol Kray and Kursk Oblast continues to remain low. The scientific institutes are providing only weak assistance to the kolkhozes and sovkhoses in accelerating this work. In 1984, the scientific institutes in Stavropol Kray sold elite and 1st reproduction seed (83 percent of the planned tasks) to the kolkhozes and sovkhoses for strain changing and strain renovation for spring grain crops.

The seed production kolkhozes and sovkhoses in a majority of oblasts, krays and autonomous republics are not carrying out their functions fully. Their seed production logistical base is weak and, as a result, they are not coping with the plans for the production and sale of high quality seed for regionalized grain crop varieties. In 1983, the specialized seed production kolkhozes and sovkhoses in Tambov Oblast fulfilled their production plan for this seed by 87 and the sale of such seed -- by 54 percent and in 1984 the figures were 70 and 24 percent respectively.

One principal means for increasing sunflower production and yields is converting over to the sowing of hybrid seed and this fact must be reflected in the farming systems. The ministry has developed a complex of measures for improving seed production for this crop and for creating distance isolation zones in the North Caucasus for the cultivation of seed for parental forms and 1st generation hybrids. The monetary bonus for the sale of high quality 1st generation hybrid seed has been raised to 600 percent and an additional payments has been established for the farm workers, specialists and leaders. For the purpose of creating distance isolation zones for regions engaged in cultivating hybrid sunflower seed, the procurement volumes for marketable sunflowers have been lowered. However, this work has still not been started in Rostov Oblast, Stavropol Kray or in the Kabardino-Balkar Autonomous Republic.

A large role must be played by sorghum in increasing the production of feed in the Central Chernozem Zone and the North Caucasus. This drought-hardy crop furnishes good yields of grain and fodder under both irrigated and non-irrigated conditions. It is valued highly by the kolkhozes and sovkhoses in Rostov Oblast. Each year, sorghum is sown here in pure form over large areas and also in a mixture with corn and other crops. This makes it possible to obtain additionally 50-100 quintals of fodder from each hectare. In the Don River region, at a base of the All-Russian NII /Scientific Research Institute of Sorghum/, a scientific-production association was created which includes the Sorgo OPKh /experimental model farm/, the Manychskiy Sovkhoz, the Sorgo Plant and several kolkhozes and sovkhoses operating on a contractual basis. Each

year this association produces 6,000-8,000 tons of seed for this crop -- 70-80 percent of the entire amount of such seed being produced throughout the Russian Federation as a whole.

However, all is not going well in all areas in this regard. Each year the kolkhoz and sovkhoz requirements for sorghum seed in Stavropol and Krasnodar krais are not being satisfied and the plans for procuring such seed for the state resources are being fulfilled by only 11-30 percent. Actually, a proper logistical base has not been created on the specialized farms.

In the organization of alfalfa seed production, there are many unsolved problems. In 1983, the farms in the North Caucasus should have produced 21,700 tons of alfalfa seed, but they actually harvested only 15,900 tons. The kolkhozes and sovkhozes in Rostov Oblast satisfied their seed requirements by only 52 percent and those in Stavropol Krai -- by 80 percent. In the Chechen-Ingush ASSR, the plan for the sale of alfalfa seed was fulfilled by 36 percent and in Krasnodar and Stavropol krais and in Rostov Oblast -- by 53-56 percent. Nor did the situation improve during 1984. Just as in the past, their yields remain low and, in addition, each year large areas of seed plantings are not being used as intended.

The production of alfalfa seed must be concentrated at specialized farms. This will make it possible to carry out the planting of seed plants using a special technology and it will preclude their being withdrawn from general plantings, as is being done at the present time at a majority of the kolkhozes and sovkhozes. Moreover, it will make it possible to solve those problems concerned with the pollination of seed sowings and to carry out timely measures aimed at combating pests, diseases and weeds. It is easier at specialized farms to master the waste-free method for harvesting seed crops, with threshing of the biological bulk at a permanent station. This technology is being introduced into operations successfully at the Kolkhoz imeni Lenin in Yeyskiy Rayon in Krasnodar Krai. As a result of laborious, timely and high quality fulfillment of all of the agrotechnical measures for cultivating alfalfa seed, with subsequent threshing of all of the biological bulk at a permanent station, the yield here was raised to 4.9 quintals for each of 109 hectares.

The successful mastering of scientifically sound farming systems and an increase in the return from each hectare are dependent to a large degree upon the extensive introduction of progressive forms for organizing and stimulating labor and particularly the brigade contract.

The systems and measures developed for mastering the farming systems must also take into account all those factors which serve to ensure protection of the natural resources. All those questions associated with preventing the contamination of soils and water resources by toxic chemicals and sewage water must be reflected in an appropriate section. The experience of those Belgorod workers who are carrying out nature-protective measures in a planned manner warrants dissemination. Unfortunately, many farms in the North Caucasus and the Central Chernozem Zone are not carrying out sufficient work in this regard.

The experience of leading collectives reveals that creative and active work by farm leaders and especially chief specialists is accompanied by success in

mastering scientifically sound farming systems and raising agricultural crop yields. The chief agronomists of kolkhozes and sovkhozes must have and make constant use of the following documents: scientifically sound farming system, book on the history of the crop rotation fields and a seed accounting journal. These three important documents provide the foundation for the stable conduct of farming operations and for a planned increase in the production of field crop husbandry products. In the event of a change in the chief agronomists, the documents are turned over to the new specialists in response to an order by the kolkhoz or sovkhoz leaders.

3. In connection with the development and mastering of scientifically sound farming systems in all zones of the Russian Federation, the necessary prerequisites have already been created for converting over to grain production on a new basis; an opportunity is at hand for achieving a higher level of intensification for the grain fields.

As is known, the Politburo of the CPSU Central Committee has approved measures for introducing intensive methods for the cultivation of winter grains and spring wheat, which throughout the republic must furnish an additional million tons of high quality grain. This is the first time that this task for growing grain crops using intensive technologies has been assigned on such a scale.

The intensive technologies for cultivating winter and spring wheats assume first of all a high level for the overall culture of farming and complete mastering of all of the elements of scientifically sound farming systems: the availability of clean fallow, applications of nutritionally balanced organic and mineral fertilizers and availability of plant protective agents and equipment.

At the same time, the new technologies require a concentration of considerable material resources aimed at achieving the planned yields. However, a concentration of resources alone is still inadequate. Intelligent use must be made of the fertilizers and crop protective agents allocated, mineral fertilizer must be applied in conformity with the nutritional requirements of the plants and in accordance with the developmental phases and stages of organogenesis and constant control must be exercised over the phytosanitary condition of a field.

When cultivating winter crops using an intensive technology, use must necessarily be made of all available technological means, so as to ensure more effective use of pesticides, fungicides, herbicides and foliar and other top dressings. Both foreign and domestic practice has shown that this cultivation method ensures more complete plant protection against diseases and pests than that furnished from an aircraft.

Special importance is attached to an agrochemical analysis of soil and to inspecting the fields for the presence of pests and diseases, since such analyses make it possible to develop agrochemical measures and an integrated plant protection system. In addition, a passport is prepared for a field. But here the most important consideration is that of ensuring that all of the measures planned are carried out completely and strictly in accordance with the established schedules. A disruption in any element of this complex (campaign against rust, stink bugs, the use of retardants, herbicides and so forth) can negate all of the laborious work performed by a large collective.

In the new technologies there are no main or secondary factors for raising yields and the quality of products -- they are all equal and a disruption or non-fulfillment of one of them leads to a shortfall in yield and a reduction in the marketable properties of a product.

The agronomic service and the services for the use of chemical processes and plant protection are required to establish a "dialogue" with the plants throughout the entire growing season and to ensure that the crops are provided with everything required for the formation of the assigned yield throughout all phases in their development. In short, in order to realize a reliable return from the resources allocated, all work should be raised to one level higher and more thorough knowledge and more accurate fulfillment of tasks are required.

This year the farms in the North Caucasus are growing winter crops in accordance with new technologies on 1,461 hectares and in the Central Chernozem Zone -- on 817,000 hectares. Towards this end, 24 and 29 percent of the winter crop fields respectively have been set aside -- one fourth of the areas allocated for the use of intensive technologies throughout the republic.

The introduction of intensive technologies is directed towards the carrying out of two equivalent tasks: achieving considerable growth in the grain crop yields and obtaining commodity grain from the indicated areas that will satisfy the highest requirements of the GOST's /state standards/ and particularly for strong and durum wheat.

Through an intensification in the production of winter crops, the farms in the North Caucasus and Central Chernozem Zone, in addition to the established yields, must obtain approximately 5 million additional tons of high quality grain.

All efforts by the agricultural organs and farm collectives are concentrated on measures directed towards achieving this increase. Moreover, the task aimed at achieving higher yields applies not only to those regions where intensive technologies are being employed. Grain production intensification applies to all. It is no secret that a considerable number of farms in both zones are heavily in debt to the state in terms of grain and not only for 1984 but for 4 years of the five-year plan on the whole. One of the chief reasons for this is the reduction that has taken place in the winter wheat sowing areas on the whole in a number of oblasts, krais and autonomous republics.

Nor is all proceeding well with regard to the quality of the grain. The kolkhozes and sovkhoses in Krasnodar Kray and Rostov Oblast have fallen well behind in their deliveries of strong wheats. During the current five-year plan, Belgorod, Tambov, Kursk, Voronezh and Lipetsk oblasts never even commenced their deliveries of strong wheats. Thus, in Belgorod Oblast the gluten content in wheat during the last years of the five-year plan amounted to 16-18 percent. True, in 1984 an increase was noted in the batches of wheat inspected, but this took place as a result of extremely dry annual conditions.

There are many reasons for a low gluten content in grain. This includes violations of the accepted agricultural practices, incomplete protection of plants against pests and diseases and inadequate measures undertaken for the purpose of raising the quality of the grain by means of foliar top dressings.

It bears mentioning that the base for carrying out this work in the Central Chernozem Zone is extremely weak. The associations of the zone's Selkhozkhimiya do not concern themselves with the construction of standard solution units.

However, the following should be added: attempts to raise the quality of grain through agricultural practices alone will not produce positive results. The variety predetermines the content for the many important protein and gluten components, their baking properties or suitability for the production of macaroni.

The gluten content is dependent to a considerable degree upon the climatic conditions and thus importance is attached to cultivating the wheat crops in regions having the best ecological conditions. This applies in particular to the Central Chernozem Zone.

But the predecessor arrangements alone are still not solving the problem. The supplies of nitrogen and elements of ash nourishment are inadequate for obtaining high yields or for accumulating a raised amount of gluten in the grain. The most radical method for improving the quality of grain -- efficient use of mineral fertilizers and the regulation by such fertilizers of the gluten accumulation processes.

With regard to increasing the procurement volumes for high quality grain, great importance is attached to a preliminary evaluation of the sowings for quality, the timely harvesting of the strong and durum wheats and the correct organization of work on a thrashing floor in connection with the processing and formation of commodity batches for delivery to grain receiving enterprises.

This problem involves many subtleties and the farm specialists and leaders must be familiar with all of them. A deficit of 1-2 percent in gluten or a shortage of several grams in natural weight up to the GOST /state standard/ norms can be easily eliminated by additional processing of the wheat on grain cleaning machines, at which time the low weight and low protein grain is removed. This involves the simultaneous drying of the grain and thus an increase in the gluten group, which is achieved additionally by a brief softening of the wheat on covered thrashing floors. The kolkhozes and sovkhoses in Stavropol and Krasnodar krais have accumulated a great amount of experience in this regard. The specialists in the Central Chernozem Zone should make greater use of this valuable experience. As a result of weak organization of the work concerned with selecting high quality grain, a large quantity of it on farms in this zone loses its individuality, becomes part of the general flow and is lost.

The use of intensive technologies must change radically this status of affairs and promote a sharp increase in the production and procurements of strong and durum wheats.

Real conditions are available for accomplishing this.

4. The initial experiments carried out in 1984 on the introduction of intensive technologies for the cultivation of winter wheat revealed that even under complicated weather conditions the farms obtained considerably higher yields of high quality grain than they did from neighboring plantings. The average yield

from such winter wheat sowings in the Kuban was 54 and in Stavropol Kray -- 53.5 quintals per hectare. During a severe drought, the kolkhozes and sovkhozes in Tambov Oblast obtained 22.7 quintals of winter wheat -- 12.1 more quintals than that obtained from conventional sowings. The farms in Lipetsk Oblast obtained 20.2 quintals per hectare from an area of almost 10,000 hectares.

Some farms achieved even higher indicators. The Kolkhoz imeni Gorkiy in Tbilisskiy Rayon in Krasnodar Kray obtained an average of 66.2 quintals of winter wheat and the OPKh imeni Kalinin at Krasnodar NIISKh /Scientific Research Institute of Agriculture/ -- 61.7 quintals with a gluten content of 32 percent. The Rossiya Kolkhoz in Novoaleksandrovskiy Rayon in Stavropol Kray obtained 55 quintals -- 20 quintals more than that obtained from the remaining tracts. Moreover, the gluten content exceeded 30 percent. The production cost for grain obtained on this farm using the intensive technology was 3.03 and using the conventional technology -- 3.37 rubles. The new technology enabled the Komsomolets Sovkhoz in Tambov Oblast, under difficult conditions, to obtain 43.8 quintals of winter wheat, while at the same time the yield for the farm as a whole was 24.5 quintals.

The initial experience of these collectives must be made available to all of the kolkhozes and sovkhozes in both zones. This is particularly important in view of the fact that the wheat yields still remain low; during the 1981-1984 period, the average yield for the Central Chernozem Zone was 18.9, the North Caucasus -- 25.6, Voronezh Oblast -- 20.2, Kursk Oblast -- 19.1 and in Lipetsk Oblast -- 14.6 quintals per hectare.

One of the chief reasons for the low wheat yields in these regions was insufficient mastering of the scientifically sound farming systems developed at the kolkhozes and sovkhozes and particularly their principal element -- crop rotation plans.

We attach priority importance to mastering the crop rotation plans in view of the fact that the systems for cultivating the soil, applying fertilizers and protecting the plants are all related to them. They are the corner-stone for maintaining order out on the land. Crop rotation plans eliminate the use of volitional methods in the cultivation of crops. The agronomists are able to carry out purposeful work aimed at raising the fertility of the soil and achieving such improvements many years in advance.

It would seem that at the present time, when there is still no problem with regard to stabilizing the grain fields, that a further expansion in the areas of clean fallow and perennial grasses and also crop rotation plans must be mastered as rapidly as possible. Unfortunately however, this is not so.

A most important factor with regard to the successful introduction of intensive technologies is the cultivation of winter crops following clean fallow. Fallow as an accumulator of moisture and nitrates is of itself a powerful factor for intensification in those areas where a successful campaign is being waged against weeds. In combination with a good top dressing of fertilizer, it retains a considerable portion of its productive strength for the following year. At the same time, a repair field becomes a fine predecessor arrangement only when complete fallowing is accompanied by the carrying out of the entire complex of agrotechnical measures and during the best periods.

Only under these conditions can wheat, when grown following fallow, furnish a worthy increase in yield. Here is some data on the effectiveness of clean fallow during 1984 (left column -- winter wheat yield following clean fallow; right column -- following non-fallow predecessor crops).

Belgorod Oblast	24.8	14.1
Voronezh Oblast	20.7	8.1
Stavropol Kray	25.2	15.2

However, we still have not been able to overcome incidents of large areas of fallow land becoming overgrown with weeds, moisture supplies not being retained and very few nutrients accumulating. There must be a change in the attitude towards the use of fallow. In any case, fallow must become an area of concentration for the efforts of farmers and for all factors concerned with the intensification of production operations. But in order to realize a full return, up to 70 tons of organic fertilizer must be applied to each hectare of fallow field, the field must be maintained in a clean state throughout the summer and it must be plowed during the best periods. A number of farms lack the farmyard manure needed for this purpose and thus other sources must be found.

At one time, a solution was proposed for this problem by Academician D.N. Pryanishnikov, who substantiated the feasibility of using green fertilizer on fallow fields. When sowing pulse crops as green manure crops, an increase takes place in the supplies of available nitrogen in the soil, nitrogen accumulated by nodule bacteria. Nutrients drawn from the arable layer by the roots of green manure crops accumulate after they have been leached out from upper layers. Experiments have shown that green manure crops are equivalent to farmyard manure in a ratio of 3:1. Each farm must decide on the spot exactly which crop is to be selected to serve specifically as a green manure crop, but green fertilizers must be employed extensively in behalf of the 1986 harvest.

Under conditions involving insufficient moisture, windbreak strips are very effective as a means for accumulating additional moisture and for combating wind erosion on a fallow field. Owing to an absence of seed, and in a majority of instances owing to a lack of understanding of the role played by windbreak strips, many farm specialists, with the tacit consent of the agronomic services, do not carry out this important work. At the same time, observations carried out by the All-Union Scientific-Research Institute of the Grain Economy on soil moisture prior to sowing spring wheat have shown that mustard windbreak strips make it possible to accumulate up to 50-60 millimeters of additional productive moisture.

In regions of the North Caucasus, the growing of wheat as a second crop following fallow, with the technology being observed in a very thorough manner, furnishes fine results in terms of yields. Here the predecessor arrangement plays a direct role.

With the introduction of intensive technologies for the cultivation of winter grain crops, special attention must be given to the principal soil cultivation, whatever type it might be -- plow or sweep.

With regard to the sowing work, it must be carried out strictly in accordance with the schedules adopted in each natural-climatic zone. The sowing norm must

be defined more precisely in conformity with the intensive technologies. They began sowing the wheat using a weight norm of 250-300 kilograms (this is more than 6 million seeds per hectare) and this was completely unjustified. In this manner, some careless agronomists attempt to suppress the weeds and also to conceal their lack of work aimed at improving the sowing qualities of the seed. In the face of a high culture of farming and further production intensification, the problem of norms is in urgent need of examination. The sowing norm must be based only upon biological motives and concern for the harvest and its quality.

A very important question is that of selecting the varieties. It can generally be said that use of the intensive technology requires the cultivation of regionalized varieties of strong and durum wheats of the intensive type and highly productive short-stalk varieties of rye. Naturally, this correct requirement does not reveal the task completely. The selection of a variety must be carried out on the basis of a complete evaluation, with emphasis being placed upon the final goal -- to obtain both a high yield and grain of the highest quality.

Of the strong winter wheats, the kolkhozes and sovkhoses in the North Caucasus are displaying definite interest in intensive type varieties deemed suitable for the new technology: Bezostaya-1, Krasnodarskaya-57, Partizanka, Donskaya Bezostaya and new varieties such as Obriy and Kolos. For the Central Chernozem Zone -- Mironovskaya-808 and Tambovitsa and two varieties that are valued on the basis of quality -- Tarasovskaya-29 and Chayka.

In keeping with their procurement plans for strong wheats, the farms in Belgorod, Voronezh, Kursk, Lipetsk and Tambov oblasts are annually reducing their sowings of Mironovskaya-808: in 1980 it occupied 1,910, in 1983 -- 785 and last year -- only 639,000 hectares. The propagation of the new winter wheat variety Tambovitsa, which possesses excellent baking qualities and a gluten content up to 32 percent, is being carried out in an extremely unsatisfactory manner in Tambov Oblast.

In addition to the correct selection of varieties for the intensive technologies, the yields are also influenced to a considerable degree by the quality of the sown seed. For carrying out seed work in keeping with the level of modern requirements, it is not enough to merely determine the indicators for germinative capability, purity, moisture content and degree of seed contamination. At the present time, an indicator has been introduced for determining the growth energy of seed. Tests and practical experience have shown that seed which has a high growth energy is capable of enduring sharp changes in temperature of the soil during the germination period, it decays to a lesser degree, it sprouts more rapidly and in greater numbers, it develops a stronger root system and, in the final analysis, it furnishes higher yields.

With regard to the quality of the seed, it bears mentioning that in the face of the requirement for using only 1st class seed for sowing in connection with the intensive technology, in Voronezh Oblast 2d and 3d class seed (38 percent) was sown in behalf of this year's harvest. In 1984, the kolkhozes and sovkhoses in Belgorod Oblast sowed 42 percent of their winter crops, cultivated in connection with the intensive technology, using seed of the 4th and subsequent reproductions and in Tambov Oblast such sowings amounted to 47 percent.

In connection with the intensification of grain production, an increase is taking place in the role played by the entire complex of organizational work directed towards the efficient carrying out of the requirements of the new technologies. It is our opinion that we still have not achieved the chief goal in the work aimed at introducing them -- the thorough mastering by each farm specialist and leader of all elements of the new technologies. And indeed these are precisely the personnel who will determine the success of this endeavor. Nor have we achieved a situation in which it can be said that each specialist of the appropriate service in a rayon, oblast, kray or autonomous republic has become an active proponent of grain production intensification, is keenly aware of exactly where assistance is required, has mastered the entire situation to perfection and actively exerts an influence upon it.

In preparing to lay the foundation for the harvest of the first year of the new five-year plan, importance is attached to examining the degree to which each farm has prepared for cultivating winter crops based upon the use of intensive technologies and to providing it with the necessary assistance. Once again, jointly with the associations of Selkhozkhimiya, the kolkhoz and sovkhoz requirements for mineral fertilizers should be defined more precisely, applications of phosphorus and potassium fertilizers to the fields should be organized and nitrogen mineral fertilizers should be accumulated for the purpose of applying split applications in accordance with the developmental phases of the crops and based upon soil and plant diagnostics.

The present period is a very important one out on the fields. The kolkhozes and sovkhozes are expanding still further their harvest operations, as they strive to gather in all of the crops rapidly and without losses. In keeping with the decisions handed down during the April (1985) Plenum of the CPSU Central Committee, the farmers are displaying a high level of labor enthusiasm as they carry out their tasks. They are directing all of their efforts towards fulfilling the obligations of the final year of the five-year plan, multiplying the contribution being made in the interest of implementing the Food Program and preparing in a worthy manner for the 27th congress of the party of Lenin.

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TILLING AND CROPPING TECHNOLOGY

SEMINAR DISCUSSES INTENSIVE CROPPING TECHNOLOGY IN RSFSR

Moscow KHIMIYA V SELSKOM KHOZYAYSTVE in Russian 8 Aug 85 pp 75-76

[Article by G. A. Titov, candidate of agricultural sciences, and I. I. Korotkova, All-Union Scientific Research and Design-Technological Institute for the Chemicalization of Agriculture: "Intensive Technology for Grain Growing -- on the Fields of Russia"]

[Text] At the VDNKh USSR [Exhibition of Achievements of the USSR National Economy] there was a conference-meeting of workers in the RSFSR Agrochemical service on the theme "Growing Grain Crops by Intensive Technology". The seminar was organized by Rosselkhozkhimiya [Russian Agrochemical Service] and VNIPTIKHIM [All-Union Scientific Research and Design-Technological Institute for the Chemicalization of Agriculture]. A. G. Gusev, the deputy chairman of Rosselkhozkhimiya, and M. I. Tatarchenkov, deputy director of VNIPTIKhIM, attended the conference.

In the opening words, M. I. Tatarchenkov, dwelt upon the tasks of chemical service design-research stations to elaborate plans for the use of chemicals, design-estimation documentation, field descriptions, the organization of control over the use of chemical equipment, and the organization of current soil and plant diagnosis of the nutrition conditions for agricultural crops, accounting for the efficiency of intensive technology, etc.

In his report, P. V. Shkunov, (VNIPTIKhIM) NIPTIKhIM), analyzed the results from the introduction of progressive (industrial, intensive) technology for growing agricultural crops during 1981-1984. He noted those oversights and shortcomings in agrochemical service work which had a negative effect upon the results from introducing progressive technology. Over 3 years the area of crops grown by industrial technology reached 2.7 million hectares. The increment in sugar beet yields compared to ordinary plantings reached 38-52 quintals per hectares; for sunflowers 3.0-3/7 q/ha, for grain 3.1 q/ha, and for potatoes 55-58 q/ha. However, the rate of return, in terms of yields, on fertilizers and other chemicals is considerably lower than the norm because of failure to observe scientifically recommended norms, the nutrient ratios in fertilizers. etc. This speaker thought that agrochemical service specialists should more strictly monitor the observance of their designs and plans for the use of chemicals.

A. P. Chichkin, (Kuybyshev SKhI [Agrochemical Institute]), explained the basic factors limiting yields in the Volga region, and methods of struggling against them when growing grain crops by intensive technology. He stressed that failure to observe any single element in the technology (time, norms, planting, depth of seeding, etc) could negate all the work.

A. V. Sotnik (VNIPTIKhIM) talked about the technology for using liquid compound fertilizers (storage, transportation, powder mixing, application) in the system for fertilizing winter and spring grain crops. He noted that it is economically profitable to specialize in the use of liquid compound fertilizers for farms (rayons) so that such fertilizers will account for at least 20 percent of all phosphorous fertilizers used.

G. V. Afinogenov, (Moscow Design-Research Station for Chemicalization), reported many interesting things about results from the introduction of intensive technology for growing winter crops at a number of farms in the oblast. Compared to ordinary methods, intensive technology has increased yields by 10-20 q/ha. Decisive factors here were: measures for protection from diseases, pests, weeds, and plant lodging, balanced nutrition, high quality tillage, and multiple (up to three times during plant growth) top dressing with nitrogen, based on data from soil and plant diagnosis.

T. N. Khusayenov, the chief agronomist at the Ilishevskiy Comprehensive Chemicalization Region Agricultural Administration, Bashkir ASSR, stressed the major role of the rayon's experimental field. Intensive technology components are operated and tested here and later introduced into production. This field was used to determine the high efficiency of the double (fall and spring) local application of fertilizer using a grain drill. This method is widely used on farms in the rayon.

Intensive technology for growing grain crops helps increase grain production to the appropriate standards for strong and durum wheats, especially if plant nutrition is properly diagnosed. This was the subject of the talk by L. N. Yefremovaya, (VNIPTIKhIM) which explained methods for plant diagnosis to determine the advisability of top dressing strong and durum wheats with liquid nitrogen. The speaker also explained the organization of liquid application units.

V. S. Kartamyshev, (VNIPTIKhIM) reported experience in using progressive technology to grow agricultural crops in comprehensive chemicalization regions. In many of them (Ilishevskiy Rayon, Bashkir ASSR, Ust-Labinskiy Rayon, Krasnodar Kray, and others) grain crop yields are 1.5 fold higher than oblast averages and higher than yields at Gossortuchastki [State variety test plots]. In the speaker's opinion, it is necessary to more widely propagandize these regions' experience, establish experimental crop rotations in order to further develop and improve intensive technology for growing grain crops.

A. S. Merzlikin (VNIPTIKhIM) used specific examples to acquaint the meeting's participants with the methodology for calculating outlays and determining the economic efficiency of mineral fertilizers when using intensive technology for growing grain on unirrigated or reclaimed land.

As the fertilizer system is being developed only on the basis of results from soil surveys, the agrochemical description of fields should be completed more quickly. This will increase the work volume of design-research stations for chemicalization. V. V. Filonenko (Moscow Design-Research Stations for Chemicalization) shared his experience in the creation of a computer data bank on the agrochemical characteristics of each land contour in the oblast. This data bank halves the outlays for elaborating plans for fertilizer applications and improves plan quality.

V. G. Sychev, (VNIPTIKhIM) and A. G. Puretskaya (Moscow KVTs [Branch computer center]) talked about the importance of well presented accounts to monitor the introduction of intensive technology and to determine its efficiency. They also acquainted participants with new requirements for accounts.

Local specialists exchanged experience. V. N. Romanyuk (Voronezh Design-Research Station for Chemicalization) discussed how in the oblast winter wheat grown by intensive technology is planted following fallow which has received comprehensive agrochemical treatment. Plans for KAKhOP [Possibly: Comprehensive agrochemical treatment of fallow] are supplemented by descriptions and technological charts for intensive cropping, guaranteed agrochemical descriptions [pasporty] and control pasporty for technology. All this helped improve the quality of design-estimation documentation, reduce work volume and facilitated field mapping.

During the meeting there were many practical questions on agrochemical support for intensive technology for grain growing. These questions were answered by A. F. Gusev and N. I. Starodubov (Rosselkhozkhimiya).

This exchange of experiences revealed the scale and course of work and tasks in agrochemical support for grain crops in the RSFSR. In the fall of 1984 5.3 million hectares of winter wheat were planted, 20 percent of this on fields which had received comprehensive agrochemical treatment. Ninety eight million tons of organic fertilizers were applied, 386,000 hectares were limed, rock phosphate meal applied on 117,000 hectares, phosphate fertilizer applied in rows during planting on 4.7 million hectares. A total of 541,300 tons (active ingredients) of mineral fertilizers were applied.

Chemical application equipment is, on the whole, used in accordance with design and estimation documentation and fertilizer use plans. However, the target for phosphorus fertilizer application was only 87 percent met.

Agrochemical service work for growing spring wheat by intensive technology is under way.

The agrochemical service was given specific tasks in work on grain growing using intensive technology.

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TILLING AND CROPPING TECHNOLOGY

ADVANTAGES OF INTENSIVE AGROTECHNOLOGY IN STAVROPOL KRAY STRESSED

Moscow PRAVDA in Russian 24 Jul 85 p 2

/Article by V. Pankratov, Stavropol Kray: "Test for a Grain Grower"/

/Text/ The grain fields in Stavropol Kray are vast: from the steppe Lake Manych to the foothills of the main Caucasus Mountain Range. Their overall area is almost 1,800,000 hectares. More than one third of the grain crops is grown using the intensive technology. The kray's farmers plan to sell as much grain as possible to the state, with strong and valuable wheats constituting a considerable portion of the overall amount sold.

The harvest work is in full swing in all areas. But if one surveys the situation attentively, he will note that the transport flow is stronger in those areas where the fields are lined out by technological tracks. In Sovetskiy Rayon, for example, grain crops are being cultivated on 27,000 hectares using the intensive technology.

"The yield is 10-15 quintals higher where the new technique has been introduced" stated the 1st secretary of the party committee G. Khurtayev, "and the grain quality is considerably better."

Moreover, the increase in the gross yield is quite substantial. True, obtaining it required a considerable amount of labor. The farmers worked very thoroughly the fallow tracts that had been allocated for the intensive technology, the seed was prepared in a scrupulous manner and the sowing norms were adhered to. Such was the situation in the autumn. And there were new concerns in the spring. The technological track was followed by units which provided assistance in applying root top dressings to the plants and in protecting the crops against weeds, pests and diseases.

At the Pobeda Kolkhoz, they estimated that the expenses associated with the cultivation of a hectare of wheat using the intensive technology amounted to 114 rubles. The yield did not fall below 41 quintals. Here they still consider this to be a "minimum." But even with such a final result, the net income of the farm as a result of use of the new technology will amount to not less than 180,000 rubles. Everybody profits. Combine operators M. Rykov, A. Seleznev, M. Usachev and G. Morozov, all of whom were combined into one harvesting team, stated: "We are finally beginning to obtain good ears."

Last year, the plants reached up to a man's waist and there was no room for an ear in one's palm. But there was no grain: it had fallen victim to disease. This year there has been no such deception out on fields on which the intensive technology is being employed.

However, are the grain growers fully satisfied with their fields? Recently the farm was visited by guests from various krays and oblasts in the North Caucasus, the Volga region, the Ukraine and the Moldavian SSR. Having come to Stavropol Kray to attend a seminar devoted to the use of the intensive technology in the cultivation of winter crops, they paid a visit to Sovetskiy Rayon. The chairman of Pobeda Kolkhoz A. Goloverov, in discussing the use of the new method, did not overlook the difficulties involved: "During the summer there was incessant rainfall and the soil became saturated with moisture. How was use to be made of the technological tracks? They did not wish to undertake any risky operations. The assistance of agricultural aviation was sought. The pilots applied a portion of the chemicals. Certainly, there was some benefit. But not the same amount of benefit that comes from ground applications. A conclusion was drawn: the progressive technology must be observed in a very strict manner.

Everywhere there was a kind word for the workers attached to the rayon agrochemical laboratory, which for a period of 20 years has been headed by L. Smirnova. They prepared field cartograms for the farms. The mineral fertilizer applications became more accurate. Only those fertilizers which were needed were applied to the soil. This year, for example, the amount of nitrogen fertilizers needed was eight times less than usual. Lyudmila Andreyevna stated:

"The soil does not need excess nitrogen. It only makes the plants lodge. We learned this from past experience."

Yes, we must glance back constantly. A reform carried out in grain growing operations, such as use of the intensive technology, requires that consideration be given to the use of scientific achievements and leading practice. The "dry" farming system developed in Stavropol Kray, which makes it possible to obtain stable grain yields under conditions involving limited amounts of precipitation, has fully proven its worth. It was precisely this work that enabled the kray's farms to achieve a stable increase in grain yields during the 11th Five-Year Plan. An average of 21.5 quintals of grain was obtained over the past 4 years and this surpassed the level for the 10th Five-Year Plan by 16 percent.

"By 1986" stated the 1st secretary of the kray party committee V. Murakhovskiy, "as stipulated in the decree of the CPSU Central Committee and the USSR Council of Ministers concerning measures for increasing the production of grain from winter crops, spring wheat, corn, millet and rice, through the introduction of intensive cultivation technologies, the grain economy will be raised to a new height. All those who are associated with the agroindustrial complex must study more thoroughly the progressive technology, master more rapidly the recommendations of scientists and the experience of leading workers and employ such recommendations and experience skilfully and to maximum advantage. Only if this is done will it be possible to realize progress.

Many of the kray's farms associate the further development of production operations with mastering the collective contract and cost accounting procedures. They plan to manage using their own resources and without taking advantage of state subsidies. Reliable stockpiles for this purpose are being created in Petrovskiy, Kochubeyevskiy, Kirovskiy, Novoaleksandrovskiy and a number of other rayons. Skilful use is being made of the intensive technology here and high grain yields are being obtained.

It is noted that this year has not been an entirely favorable one for the kray's grain growers. A portion of the areas has to be undersown or resown. Many tracts turned out to be sparse or low in height. They differed substantially from tracts on which the intensive technology was employed. But is it always possible to justify such neglect by references to poor weather? For example, over the past 4 years the grain crop yields at kolkhozes and sovkhoses in Predgorniy Rayon decreased by 3 quintals. Of 18 farms engaged in grain production, only six are fulfilling their plans for gross yields.

During the autumn of last year, the RAPO decided to increase the sowings of winter barley. Under the soil-climatic conditions prevailing here, this crop furnishes a good yield. From a discussion with the chief of the rayon agricultural administration N. Cherevashenko, it was learned that many began placing their seed in the soil earlier than the optimum agrotechnical periods. And they miscalculated. The grain crops entered the wintering period overgrown. As a result, they were unable to endure the low spring temperatures. With the reorganization of grain production based upon use of the intensive technology, such mistakes can result in a futile expenditure of forces and resources.

The right to use the new technique cannot be presented in the form of an "edict." The intensive technology is a means for placing trust in a grain grower. And this trust must be earned. This point was made during a zonal seminar devoted to methods for improving grain production. Success was guaranteed to those who displayed a high degree of competence and who achieved an improvement in their professional expertise.

Such an approach is being followed in Stavropol Kray. However, by no means is it being followed by all. In Kurskiy Rayon, for example, grain crops have been planted on almost 79,000 hectares. This is a large area and the grain yields are low. During the years of the 11th Five-Year Plan, the farms fell in debt to the state to the tune of 22,000 tons. Very poor use is being made of fallow here. The overall area of fallow is 33,000 hectares. It is only rarely that one does not see weeds here. At times, the shepherds use this land for pasture purposes. It contains rich feed for sheep and the grain yield does not exceed 24 quintals.

It is clear that under such conditions the progressive method may not produce the required results. Before undertaking to use this method, a farm must first learn how to use correctly the conventional technology. Not all are able to do this. At the Kanovskiy Sovkhoz, I overheard the director I. Kozhushko stating that he was unable to sleep at night because he was thinking constantly about carrying out the harvest work successfully. But what is the use? The equipment works poorly and quite often lies idle. The output of the machine operators is

one of the lowest in the rayon. The initial barley yield was 13 quintals per hectare. Many of the grain crops remain standing. The personnel complain regarding poor food services: "The menu is monotonous and the food is prepared in a tasteless manner." Thus the Kanovskiy Sovkhoz continues to have poor crops.

Another farm automatically comes to mind -- the Pobeda Kolkhoz in Petrovskiy Rayon. Its chairman is Hero of Socialist Labor L. Popov. There is no matter concerning the harvest campaign, regardless of how trivial, that does not merit the attention of the chairman. And he has reliable, thorough and intelligent assistants. As a result, the kolkhoz's yield is not lower than 30 quintals. And the fields set aside for use with the intensive technology produce more than 50 quintals per hectare.

Last year the net income of the Pobeda Kolkhoz exceeded 4 million rubles. The chairman of the administration does not trouble himself with counting the kopecks. This is done by the economic service. It was explained, for example, that the most profitable harvest team was the one headed by A. Bogoslovenko. Eight machine operators work on the basis of the collective contract and they all strive to achieve high final results. A reduction has taken place in the number of trucks needed for hauling the grain from the combines and this turned out to be profitable for both the farm and the machine operators.

Meanwhile, in some areas, during the course of creating harvesting-transport complexes, special attention is not being given to the psychological micro-climate within a team or a combine crew. As a result, the work is suffering and economic advantage is being lost.

During this same zonal seminar, mention was made of the need for raising the responsibility of the partners in the agroindustrial complex for the conscientious fulfillment of mutual obligations. A positive evaluation was assigned to the work being performed by inter-farm enterprises for the mechanization of production operations, which have been created in Stavropol Kray. They provided assistance in improving the operation of machines and they are providing reliable support to the rayon agroindustrial associations. But there are tasks which they cannot solve using their own forces alone. Some machines lack the required degree of reliability and the quality of the mineral fertilizers and chemical preparations is low. Thought must be given to these problems by the workers of Minudobreniy /Ministry of Fertilizers/, Minselkhoz mash /Ministry of Tractor and Agricultural Machine Building/ and Minkhimprom /Ministry of the Chemical Industry/. Yes and the remaining departments associated with the agroindustrial complex should display concern for radically reorganizing operations in conformity with the interests of the grain growers.

The roar of motors continues to be heard out on the Stavropol fields. Barley and wheat are being delivered to the state granaries. And although it is still too early to summarize the harvest results, nevertheless one fact is clear: the intensive technology has passed the test.

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TILLING AND CROPPING TECHNOLOGY

USE OF INTENSIFIED AGROTECHNOLOGY IN KRASNODAR KRAY

Moscow SELSKAYA ZHIZN in Russian 3 Nov 85 p 1

Article by Yu. Semenenko, Krasnodar Kray: "Winter Crop Fields in the Kuban"

Text For 10 years now, Nikolay Denisovich Barsukov has headed the agronomic service at the Kolkhoz imeni Kirov in Leningradskiy Rayon. Today he left the fields for the administration building in an elevated mood. And why not! The wheat and barley cover the fields in the manner of a vast emerald green carpet.

"We have 4,578 hectares of winter crops. On 4,250 hectares, we are cultivating wheat and barley using a new technology" stated Barsukov as he carefully removed several plants from the ground, "Each grain has furnished 3-4 shoots and has a well developed secondary root system. And the leaves and roots are actively accumulating nutrients. This is a very important condition. Indeed, in previous years the seedlings were unable to complete their next phase of development or become stronger in the autumn. Following the wintering period, the tillering of the remaining plants took place mainly in the spring and, as a result, the winter crops did not develop sufficiently well. Hence there was a drop in their yields and a delay in harvesting them."

This year the weather did not fail the Kirov workers. But the weather was not the main factor. Rather, it was the greater concern displayed by the farmers for their winter crop fields. And in this sense it is difficult to exaggerate the importance of the intensive technology. For it was this technology which made it possible last year to obtain 45.9 quintals of high quality grain per hectare from an area of 2,745 hectares.

The first year of operations involving use of the progressive agrotechnology produced various results -- both successes and failures. And they taught the grain growers a great deal. First of all, more attention was given to the work of the agronomic service and to accurate observance of all of the necessary requirements. For example, the kolkhoz workers completed their pre-sowing preparation of the soil in a considerably more organized manner than was the case in previous years, they treated their seed in advance with the Baytan preparation and they carried out their sowing work earlier than usual.

Formerly, an increased depth of seed placement -- 6-8 centimeters -- caused a delay and weakening in the appearance of the seedlings. This depth has now been reduced by 2 centimeters.

The agrochemical laboratory carried out an inspection of the fields and determined the nitrogen, phosphorus and potassium content in the soil. This served as a type of compass for the agronomists. All fertilizer was applied here taking into account the soil cartograms and the planned yields.

Each winter crop field is under constant observation by the agronomists. Nothing escapes their notice. In early September, individual specimens of grain beetle larvae appeared on the edges of fields in some areas. This would seem to be merely a trifle and yet it served to alarm the specialists: why lose even a small portion of the crop? All of the fields on which this pest was noted were treated with Bazudin solution.

A decision was made to employ biological measures in order to prevent damage to the crops by mice.

At the present time, a majority of the farms are accumulating fertilizers, herbicides and toxic chemicals for winter and spring applications and training is being provided in the use of special equipment, to be used for carrying out all work involving use of the intensive technology.

"It could not be otherwise. The time when people simply sowed their wheat and then waited for the harvest has receded irretrievably into the past. Today the crops must be nourished by means of daily and laborious work and through the efforts of the farmers and their partners -- workers attached to Selkhozkhimiya, aviation, Selkhoztekhnika and the plant protection services" stated Hero of Socialist Labor and chairman of the Pobeda Kolkhoz in Kanevskiy Rayon V.F. Reznikov,

This is precisely what is happening on the farm. So as not to carry out their work in a blind manner, the agronomists maintain close contact with the kray's scientific centers and they invariably use in their work data supplied by a very well equipped kolkhoz laboratory. This makes it possible to determine more accurately the mineral fertilizer dosages and the schedules and quality for the carrying out of various measures.

In October I traveled throughout almost the entire Kuban region and I met with many grain growers, specialists and scientists. My impression is as follows: throughout the kray, thorough attention is being given to the winter crop fields, which occupy 1,658,000 hectares. Of this amount, the plans call for wheat and barley to be grown on 313,000 hectares using the intensive technology. This is almost three times more than at the present time.

In view of the kray's increasing requirements, work out on the winter fields is being reorganized in a radical manner. This has been promoted by training organized by the kray party committee. The new work is understood by all, commencing with the farm and RAPO specialists and ending with the sowing personnel.

This is the first year that the intensive technology has been employed on a large scale. Despite the absence of experience and weather considered to be not very favorable for the development of winter crops, 35.6 quintals of strong and valuable wheat were obtained from each of 467,000 hectares. On fields where it

was grown using the traditional method, the yield amounted to only 24.6 quintals. Thus the difference amounted to 11 quintals in favor of the intensive technology. This increase compensated for the expenditures involved.

Nevertheless, the yield obtained was far from that planned. Why did these blunders occur and how are the grain growers and their APK partners reorganizing on a new footing? These questions were asked repeatedly during the mass inspections which took place in September and October and which were followed by conferences. Committees consisting of competent specialists, scientists and leading production figures visited nearly every field. They investigated the situation in detail and outlined measures for avoiding the mistakes which occurred last season and unfortunately there were many of them. Thus those crops which were grown following predecessor crops that were harvested late perished either completely or partially. Some farms sowed wheat in November and even December and naturally it did not produce any seedlings and others sowed following the harvesting of the best predecessor crops -- peas, alfalfa and annual grasses -- fields occupied by post-harvest corn. The situation was complicated by late deliveries of some chemical preparations.

The agricultural requirements are presently being observed in a more strict manner and field work is proceeding more successfully. Nevertheless, by no means are the correct conclusions being drawn on every farm. In some areas, the sowing work is again being carried out very late. Many kolkhozes and sovkhozes in the Adygey Autonomous Oblast and in Krymskiy, Otradrnenskiy, Timashevskiy and other rayons have still not completed this work even though the sowing rates for the kray as a whole were considerably higher than those for last year.

Not all of the farms have improved their soil preparation work for the sowing of winter crops. At the Put Lenina Kolkhoz in Korenovskiy Rayon, for example, plowing is still being carried out using mainly mouldboards without skimm-coulters and to a depth of 18-20 centimeters. Upon traversing such fields, I saw vertical clumps of dirt in all areas, with the soil being dry throughout the entire depth.

A simplification of the agrotechnology is presently being tolerated on some farms in Krylovskiy, Vyselkovskiy, Oktyabrskiy, Kavkazskiy and some other rayons.

The Kuban farmers have for a long period of time been using 1st and 2d class seed for sowing their winter crops. But it is believed that the time is at hand for converting over fully to the use of the best quality-standardized material. It bears mentioning that many specialists and scientists have justifiably raised the question of strengthening the standards. The tolerance in presently existing GOST's /state standards/ for seed in terms of weed and impurity content is too great, the lower threshold for laboratory germinative capacity is too low and the presence of grains having micro-cracks, which do not produce seedlings, is not being taken into account. Knowing this, is it any wonder that the farms raise the sowing norm by one and a half to two times and lose grain in the process.

At the present time, one sees tractors with unusual cultivators on the Kuban fields. They are being employed on tracts where the winter crops were sown using the cross-row sowing method. They are mainly being laid out every 10.8

and 14.4 meters. And indeed one year ago the reference point was for a width of 21.6 meters, with such a plan being efficient in all respects. But it turned out that there were almost no machines available for working the crops with the required swath width. True, the kray association of Selkhoztekhnika prepared 800 wide-swath units, but it made them in an off-hand manner. The "wings" of all of the machines snapped off and thus the required degree of dispersion of the preparations was not achieved. Although they have now shortened the booms, it is still not known how the units will operate.

Next year, the plans call for 45 quintals of grain to be obtained from each "intensive" hectare and for the overall increase to be raised to 1,480,000 tons. It is a matter of honor for the Kuban farmers and their APK partners to ensure that this goal is achieved.

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TILLING AND CROPPING TECHNOLOGY

CHULPAN WINTER RYE VARIETY DEVELOPMENT DISCUSSED

Moscow SELSKOYE KHOZYAYSTVO ROSSII in Russian No 9, Sep 85 pp 33-34

[Discussion by A. Ibrayev, Bashkir ASSR Minister of Agriculture, N. Gabdrakhmanov, Director of the Department of Chemicalization of Farming in the republic association Selkhozkhimiya [Agricultural Chemical Association], K. Nizamiyeva, senior agronomist-inspector of the republic Gosseminspektsiya [State Seed Inspectorate], R. Gadelshin, senior agronomist of the Aurgazinskiy Rayon Agricultural Administration, M. Gatiatullin and A. Andreyev, senior agronomists at Kolkhoz imeni Zhdanov and Iskra Kolkhoz, and M. Akhmedov, senior agronomist of the teaching farm of the Bashkir SKhI [Agricultural Institute], as lead by P. Sedov, under the rubric "Grain Production--A Key Problem": "Chulpan Will Become More Productive: At an Editorial Round Table"]

[Text] This year in Bashkiriya on an area of 250,000 hectares the Chulpan winter rye variety is being cultivated for the first time using intensive technology. What difficulties have farmers met with? What are the prospects for that which has begun? This was discussed at an editor's round table by A. Ibrayev, BASSR Minister of Agriculture, N. Gabdrakhmanov, Director of the Department of Chemicalization of Farming in the republic association Selkhozkhimiya, K. Nizamiyeva, senior agronomist-inspector of the republic Gosseminspektsiya, R. Gadelshin, senior agronomist of the Aurgazinskiy Rayon Agricultural Administration, M. Gatiatullin and A. Andreyev, senior agronomists at Kolkhoz imeni Zhdanov and Iskra Kolkhoz, and M. Akhmedov, senior agronomist of the teaching farm of Bashkir SkhI.

[Sedov] In the RSFSR it is planned to increase average annual grain yield to 140-142 million tons during the 12th Five-Year Plan as compared to 134-136 million during the 11th. There are great expectations with regard to intensive technology of grain cultivation. How well prepared are the farmers of the Bashkir ASSR for introducing this technology?

[A. Ibrayev] We look at this technology as the continued development of scientifically-based farming systems developed by us as long ago as 1982. Some of its elements have been used in our fields for a long time already.

For example, in Sterlitamakskiy and Kazangulovskiy test farms good work was done with clean fallow, with a yield of 40-45 quintals of winter grains per hectare during favorable years. In Dyurtyulinskiy and Ilishevskiy rayons the most effective methods for soil cultivation were developed and introduced in their time. In dozens of enterprises farmers learned to utilize fertilizers economically and correctly. All that was left was to combine individual elements into a single whole in order to later utilize them on a republic scale. This year the new technology was introduced in 625 enterprises (there is a total of 800 of them). Everywhere the proportion of clean fallow, the best predecessor, has reached the optimum--10 percent of arable land. Winter rye was sown only on clean fallow and soil cultivation was carried out in accordance with new recommendations everywhere.

[A. Andreyev] We carried out basic soil cultivation in August. In order to avoid the formation of plow sole, which as we know decreases the water permeability of the subplowing layer and increases erosion, we are carrying out subsoil cultivation using chisel cultivators, non-mouldboard plows and slotting machines to a depth of 35-40 centimeters. We absolutely must preserve stubble, otherwise it is impossible to retain moisture.

[M. Akhmedov] The soil must be taken care of even in the spring. This year already in March the weather allowed us to cultivate arable land using "Bigs" and LDG-15's with flat discs. After this much less moisture evaporated than usual. But after a period of time weeds began to overrun fields. We found a way to manage them as well--we cultivated and then disced the fields. We immediately applied organic fertilizer and liming materials using BDT's [Heavy disc harrows].

[M. Gatiatullin] Of course it is important to retain moisture. But intensive technology requires careful leveling of fields. The upper layer should be cultivated in such a way as to make sure that at least 80 percent of clumps are no larger than 10 centimeters. This can be achieved with the help of units from RVK [Expansion unknown] and VIP [All-Union Scientific Research Institute of Equipment and Technology for Measurement in Agriculture]. Levelling is carried out at an angle to the direction of the basic cultivation with a covering of contiguous channels.

[Sedov] From your statements, comrades, it is obvious that in soil cultivation everything is important. The slightest deviations will lead to harvest losses, in the final analysis. However, the significance of intensive technology has to do not only with mechanical cultivation but also with the most extensive utilization of fertilizers, which must be used to the full degree. To what extent is this condition being fulfilled?

[N. Gabdrakhmanov] Akhmet Talkhovich spoke about clean fallow, which is earmarked for the cultivation of the Chulpan variety according to intensive technology. I must add that each hectare in this crop received 40 tons of organic fertilizer. Nevertheless, last year on 50,000 out of 250,000 hectares we carried out overall agrochemical cultivation. This means that in addition to lime and a certain norm for mineral fertilizers, 56 tons of organic fertilizer were utilized per hectare.

[Sedov] What does "a certain norm for mineral fertilizers" mean?

[N. Gabdrakhmanov] This is the quantity of mineral fertilizer needed to produce the planned harvest with a consideration of the fertility of each field.

[A. Ibrayev] I must mention that the republic received an additional 70,000 tons of mineral fertilizer for the purpose of cultivating grains according to intensive technology. Additionally! This is considerable aid. But is every kilogram of mineral fertilizer used in the best manner? Is all mineral fertilizer used on fields where Chulpan is being cultivated according to the new method? Do we always make use of the achievements of science and progressive practice? We do not have to go far to seek out examples--not somewhere overseas but right here in our republic, in the Bashkir SKhI, a plowshare was devised for the oblique-strip application of mineral fertilizers. Effectiveness has been excellent. But not all specialists of enterprises by far made use of this innovation. We are speaking about intensive technology, about taking the maximum from each plot of land, but at the same time we ourselves continue to exhibit immaturity.

[M. Akhmedov] Here on the teaching farm the new plowshare has proven itself well. Those who have not yet begun utilizing it are losing a great deal. But there is still the problem of the sometimes intolerable wastefulness as concerns mineral fertilizers. Some feel that kasha cannot be spoiled by butter and apply excessive doses of fertilizer per hectare. But here we should act circumspectly--we should carefully study data in the book of field history and we should not be too lazy to carry out additional soil analyses. Then it may turn out that nitrogen is required only in very small amounts.

The experience of our teaching farm fully confirms this. A yield of 30-40 quintals of winter rye grain per hectare was achieved here by applying nitrogen only during top-dressing using disc sowers perpendicular to the direction of rows, and during the booting phase--from airplanes. Both top-dressings are based on a calculation of 20-30 kilograms of active substance per hectare.

[R. Gadelshin] We must not forget the fact that in every rayon and enterprise there are different conditions for raising the Chulpan variety. Whereas in Ufimskiy Rayon, for example, two top-dressings are sufficient, in our Aurgazinskiy Rayon it is necessary to apply an additional quintal of nitroammophos during sowing.

[Sedov] What is the situation with the quality of seed sown on 250,000 hectares earmarked as "industrial" fields?

[K. Nizamiyeva] Gosseminspektsiya has also made a contribution to the introduction of new technology. First of all controls were strengthened over the production, storage and preparation of seed and over its quality. We proceeded from the idea that in order to produce even and simultaneous shoots we must sow only large, smooth, first-class seed. We examined the seed funds of all enterprises no fewer than three times and if it turned out that the

seed did not correspond to necessary requirements the required measures were taken.

We made a great effort to control the timely treatment of seed with film-forming preparations. We also attempted to make sure that fields were sown with seed from the first and second reproductions. Four months before sowing the growth strength of seed was determined.

[R. Gadelshin] We have noted more than once that infection of plants with diseases or pests depends on the time of sowing. Of course everyone wants to complete sowing as early as possible, but it is precisely with early sowing that the Chulpan variety overgrows and becomes infected with rust and pests. Already beginning in the fall plants begin to perish and become spare, and their winter-hardiness decreases. There is nothing to be said about late sowing. Last year we sowed Chulpan on 20-25 August and feel that we did not make a miscalculation.

[M. Akhmedov] On our teaching farm we also carried out sowing operations at approximately the same time. But probably in order to protect the plant from diseases and pests not only the sowing schedule but the timely completion of preliminary measures as well are important. In other words, we are introducing an integrated system of plant protection.

[A. Andreyev] I think that intensive technology presupposes the consideration of local experience. After all, we have been working in the fields and we raise varieties which we are very well acquainted with. It is said, for example, that with intensive technology in grain cultivation it is necessary to use retardants. But what good are they to the Chulpan variety? They will just increase the cost of the grain.

[P. Sedov] Basically there is no argument here. The introduction of the new must be based on the experience and knowledge of farmers themselves. It is also apparent that the elaboration of elements of progressive technology is not possible without the active participation of scientists. Let us return to the integrated system of plant protection.

[N. Gabdrakhmanov] The expediency, volume and frequency of using chemical means of plant protection are determined by us according to the results of crop surveys; we take the number of pests and entomophages and the degree of development of diseases into consideration. Scientifically-based thresholds of harmfulness have been established for every pest and disease. Let us say for example that the presence of 10 grain moth caterpillars per 100 seed ears or 20 on regular ears is the signal for using pesticides.

[A. Andreyev] Once during the summer we suddenly discovered powdery mildew in the field. It seemed that we had done everything to avoid this--during non-radical top-dressing we have applied 8 kilograms of potassium chloride, 7 kilograms of superphosphate and half a kilo of bayleton [Translation unknown] per hectare. Nevertheless...About 20 days before harvesting it was necessary to spray crops with a 50 percent solution of fundozol.

[M. Akhmedov] Here another method has fully proven itself. During the tillering phase we treat rye crops with a working solution consisting of 20-25 kilograms of urea, 15-20 kilograms of double superphosphate, 8-10 kilograms of potassium chloride, 200-300 grams of manganese sulfate, 0.6 grams of bayleton and 200-300 liters of water per hectare. During the booting stage crops are treated with a solution in which 250 liters contain 50-55 kilograms of urea, 0.6 kilograms of bayleton and 0.7 kilograms of insecticide against thrips. Such protective measures have enabled us to produce a harvest of 40-45 quintals of winter grains per hectare for a long time now.

[A. Ibrayev] I would like to emphasize that in an integrated system of plant protection we cannot forget the fact that chemical methods do not have to have a negative effect on the environment. With this goal the ministry has conducted special seminars.

[N. Gabdrakhmanov] In order to improve technical services to kolkhozes and sovkhozes, Selkhozkhimiya has undertaken a number of urgent measures. With the availability of 555 rod sprayers manufactured industrially, it produced an additional 650 rods for OBT-1 sprayers. In rayon associations and kolkhozes and sovkhozes there are 300 mixing networks today.

[M. Andreyev] In order to raise Chulpan, as well as other crops, according to intensive technology the enterprise must be fully supplied with mineral fertilizers, herbicides, pesticides and of course technology. In our kolkhoz in addition to Chulpan we raise vegetables and sugar beets, which also require, and at the same time as rye, treatment with pesticides. But there is a shortage of OPSh-15 sprayers. We should probably carefully think through the problem of supplying the necessary machines to enterprises which cultivate crops according to intensive technology.

[M. Gatiatullin] In general we feel that the first year of raising the Chulpan variety according to intensive technology has been successful. It is true that the weather interfered greatly. But if we had raised rye according to the old method our results would have been much more modest. Thirty quintals or 19--the difference is a huge one!

[From the editors] This discussion took place before grain from the new harvest began to arrive in the republic's granaries. When we were composing this issue we called A. Ibrayev, BASSR Deputy Minister of Agriculture, on the phone and asked him to report on the first results. Here is what he said: "Already at the start of harvesting operations it is evident that the yield of the Chulpan variety, which was cultivated according to intensive technology, will be much higher than the yield on regular fields, despite the caprices of weather. In Ufimskiy, Karmaskalinskiy, Aurgazinskiy, Dyurtyulinskiy, Ilishevskiy and other rayons the "intensive" hectare yielded 40 quintals of grain. In individual enterprises such as Kolkhoz imeni Salavata of Sterlitamakskiy Rayon, Kolkhoz imeni Kirov of Chekmagushevskiy Rayon, and Oktyabr Kolkhoz of Ilishevskiy Rayon grain yield surpassed this figure. On the average throughout the republic the Chulpan harvests on fields employing intensive technology comprised 38 quintals per hectare. Now sowing has been

completed. Specialists, machine operators and all agricultural workers in the republic are sure that the 1986 harvest will be even larger."

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TILLING AND CROPPING TECHNOLOGY

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PROGRESS, PROBLEMS IN WINTER RYE CROP DEVELOPMENT IN SIBERIA

Moscow SELSKOYE KHOZYAYSTVO ROSSII in Russian No 8, Aug 85 p 22

[Article by Ye. Mukhordov, director of the laboratory of winter crops of VSGI [All-Union Institute of Selection and Genetics] of SibNIISKhoz [Siberian Scientific Research Institute of Agriculture] and by S. Dimukhametova, junior scientific worker, Omsk Oblast: "Winter Rye in Siberia"]

[Text] One of the special characteristics of the climate in the Omsk Irtysh area is the short frost-free period lasting 100-115 days. During this time winter rye, which already matures in early August, "has time to settle in" better than other grain crops. It is characterized by a high potential productivity and during a "normal" year it yields grain with good market qualities. Rye plants utilize fall and winter precipitation better and are more resistant to drought during the first half of the summer. Beginning growth early in the spring, rye suppresses weeds by depriving them of food, light and moisture. Well bushed out plants protect the soil dependably from wind and water erosion. Under our conditions winter rye becomes infected with diseases and pests to a lesser degree. Already in early June its green mass provides valuable feed which is especially suitable for young animals.

We also know that Siberian farmers are experiencing a shortage of early-maturing varieties of spring wheat. This deficiency can and must be made up by means of winter crops.

We also cannot underestimate the organizational-economic significance of winter crop fields.

Having taken the recommendations of scientists from SibNIISKhoz and the Omsk Agricultural Institute as their springboard, Omsk farmers in 1983 passed a resolution to significantly expand the area in winter rye for grain. However, insufficient attention was paid here to cultivating it correctly since the basic grain crop has traditionally been spring wheat. Often farmers departed from optimal sowing schedules, ignored good predecessors and sowed newly-harvested seed. For this reason the productivity of rye did not exceed 10 quintals per hectare in the oblast for a long time.

There were also objective factors which hindered the growth of winter crop fields--in Omsk Oblast there was a shortage of fallow land, which is the main predecessor for rye in Siberia, and procurement prices for this crop were low.

A serious cause of problems in the cultivation of rye involves the clearly inadequate transitional seed fund. This circumstance resulted in late sowing and a decrease in yield as a result of the sowing of newly-harvested and physiologically-immature seed. During cold winters weak, non-bushy plants perished completely. Now serious measures have been taken to strengthen seed farming. In 1984 70 percent of the area in this crop was sown with seed from the 1983 harvest. This year seed from the transitional fund will be used to sow 92 percent of the area.

With the introduction of a scientifically-based zonal farming system it has become possible to distribute winter rye on clean fallow. This guarantees the production of large and stable grain harvests. The task of farmers now can be formulated in the following manner--to achieve strict adherence to the entire complex of agrotechnical methods of rye cultivation.

In SibNIISKhoz interesting experience has been amassed on cultivating rye using non-fallow predecessors--irrigated annual grasses. Grasses are harvested in July and fields are cultivated with the preliminary application of organic and mineral fertilizers. The productivity of grains on such plots comprised an average of 40.5 quintals per hectare in 1982-1984.

Until recently the expansion of sowing area in rye was severely hindered by the absence of varieties that were resistant to lodging. Now the Chulpan and Tetra-Korotkaya varieties have arrived in Omsk fields. In addition to a high technological effectiveness (these varieties are easily harvested using direct combining) they are characterized by good productivity--frequently under production conditions these varieties yield 45-50 quintals per hectare, and in some enterprises (for example, in Kolkhoz imeni Romanenko of Gorkovskiy Rayon)--49-50.

Not long ago an enterprise was paid 8 rubles 60 kopecks for a quintal of winter rye and 14 rubles 30 kopecks for spring wheat. Today in the northern zone the procurement price for rye is 20 rubles. The enterprises of the northern forest-steppe zone are paid 12 rubles 30 kopecks. Such prices enable enterprises to manage the grain industry profitably.

It is usually felt that rye is inferior to wheat in the bread-baking qualities and protein content of grain. However, our research demonstrates something different--the grain of spring wheat cultivated in the northern zone of Omsk Oblast contains 11 percent protein, whereas rye grain cultivated under the same conditions contains 12-13 percent protein. The year 1984 convincingly demonstrated the potential of winter rye. During exceptionally difficult weather conditions for spring grains (summer--drought, fall--uninterrupted rainfall) on an area of 70,000 hectares an average of 17.7 quintals of grain per hectare were harvested. The state has been sold 58,000 tons of grain. This is equivalent to almost three annual plans. In Znamenskiy Rayon 18.9 quintals per hectare were produced. In Tarskiy Rayon 18.8 quintals were threshed per hectare. In the northern forest-steppe zone Krutinskiy Rayon

held the record--21.6 quintals per hectare. This success was brought to the rayon by the rapid transition to the Chulpan variety, which is known for its productivity. Within a short period of time the rayon sowed 90 percent of the area it has allocated for rye in the Chulpan variety. After introducing short-stemmed varieties the farmers of Muromtsevskiy Rayon began to harvest an average of 21 quintals of grain per hectare.

Good harvests can be produced in the southern forest-steppe zone as well. For example, in the Omskoye OPKh [Experimental Model Farm] 48 quintals were threshed on each of 50 hectares. In Pamyat Chapayeva Sovkhoz 43.3 quintals of winter rye grain were harvested on each of 100 hectares.

Unfortunately, the technological requirements for cultivating rye, which were developed with a consideration of soil-climatic characteristics and agrotechnology based on variety, are not adhered to everywhere. Otherwise how would we explain the low yields in Bolsheukovskiy and Ust-Ishimskiy rayons? After all, the conditions for cultivating winter crops are more favorable here than in other rayons. Nevertheless, in these rayons rye was sown after poor predecessors, soil was prepared in an untimely manner and unconditioned seed was sown. This is why productivity does not exceed 11 percent here.

It is important to top-dress winter rye on schedule. Nitrogen fertilizers are best applied locally using the method of cutting down to a depth of 4-5 centimeters using sowers with disc plowshares. An effective method for caring for winter fields is spring harrowing, during which shoots are thinned, dead plants are removed and solid crust is broken down.

Last winter turned out to be the most severe in the last 17 years. Total minus temperatures, according to data from the hydrometeorological center, comprised 2489-2717 degrees from north to south, which is 180-385 degrees more than usual and 925-1115 degrees more than during the preceding winter. Suffice it to say that the soil has frozen to a depth of 150-160 centimeters. Nevertheless, most rye plants wintered well and satisfactorily. This is attested to by the spring growth of plants in samples from ten oblast rayons.

Thus, winter rye successfully passed the regular tests on Siberian fields.

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TILLING AND CROPPING TECHNOLOGY

GRAIN SEED PRODUCTION DEVELOPMENT IN PENZA OBLAST

Saratov SNEPNIYE PROSTORY in Russian No 4, Apr 85 pp 20-22

[Article by V.S. Yepifanov, Candidate of Agricultural Sciences and deputy director for scientific work, I.Ya. Yakovlev, head of Seed Production Department and V.N. Romanova, senior scientific worker, Penza Oblast Experimental Station: "Stable Seed Production for Grain Crops"]

[Text] Penza Experimental Station -- the oldest scientific-research institute for agriculture in the Volga region. Last year it celebrated its 75th anniversary. From a small experimental field consisting of several patches of land during the pre-revolutionary years and equipped with horse-drawn plows and wooden harrows, the station has grown into a modern scientific-research institute with a large pool of highly productive machines and complicated items of equipment for carrying out the necessary studies. All of its scientific and production activity is closely associated with the work of the oblast's farms. Over the past half century alone, more than 1 million quintals of quality standardized seed for grain crops, tens of thousands of tons of elite potato tubers and several thousand quintals of grass seed for high reproductions have been sold. During the 11th Five-Year Plan, their annual sales were raised respectively to 50,000-60,000 quintals, 450-500 tons and 250-300 quintals. The farm leaders and specialists have been provided with dozens of recommendations dealing with the problems of agricultural production and hundreds of articles have been published in newspapers, journals, works and collections.

Just as in the past, a key problem in agriculture continues to be that of achieving a stable increase in grain production. While maintaining stable grain crop plantings, a need will exist for raising the grain yields throughout the country by 6-7 quintals during the decade and reaching a total of 21-22 quintals per hectare by 1990. A decisive factor for the successful completion of this task is the rapid introduction into production operations of highly productive varieties. Through the replacement of less productive varieties by more productive ones, it will be possible to obtain not less than 200,000 additional tons of grain in Penza Oblast alone.

In 1983, having introduced a scientifically sound farming system into operations, the oblast's grain growers fulfilled their plan for selling grain to the state by 108 percent. The average grain crop yield over an area of 1.5 million hectares was 16.8 quintals per hectare. A considerable improvement took place in their seed production work. Compared to the 10th Five-Year Plan, when the sowings of high reproductions amounted to 35 percent, by the end of the third year of the 11th Five-Year Plan this figure had been raised to 48 percent. The quality of the seed being sown had also been improved.

The seed production system for grain crops which existed earlier in the oblast, with its 2-year period of strain renovation, did not ensure fulfillment of the production plans or the sale of seed of high reproductions and this hindered the implementation of the seed production program. A new seed production program was adopted in 1981. Three scientific-research institutes: the oblast experimental station, the Petrovsk Breeding-Experimental Station and a training farm of the agricultural institute -- furnish seed in the amount of 56,000 quintals to raysemkhozes /rayon seed farms/ (1-2 farms in a rayon), which in turn cultivate 2d reproduction seed in the amount of 100,000 quintals and thereafter sell it to propagation areas of seed production brigades and to departments of rank and file farms. All rayons are now interested in stable work being performed by the seed production farms. In the interest of ensuring planned strain renovation work on an annual basis, many raysemkhozes have been released from having to deliver grain to the state.

The oblast experimental station is the leading scientific research institute for seed production for agricultural crops. It supplies elite seed for regionalized and promising grain crop varieties to 15 semkhozes /seed farms/ in 12 rayons -- more than 47 percent of the oblast plan for primary seed production. Each year the station obtains stable grain crop yields and this makes it possible to cope successfully with the production and sale of seed of high reproductions. The state plan calls for the annual sale of 26,800 quintals of elite seed to the oblast's semkhozes. During the 9th Five-Year Plan, we fulfilled this task by 144 percent and during the 10th -- by 153 percent. During the 11th Five-Year Plan, despite the severe drought of 1981, we have been able to fulfill ahead of schedule the task for the sale of grain crop seed of high reproductions, potatoes and grasses. In 1983, the planned yields for the final year of the 11th Five-Year Plan (see Table) were achieved for a majority of the crops.

The most productive crop was Chulpan winter rye: in 1983 we obtained more than 40 quintals per hectare from an area of 750 hectares. This intensive variety responds very well to rich soil. It is distinguished by a high degree of winter hardiness, strong tillering and considerable resistance to lodging and thus on fallow land that has been topped off with fertilizers it is beginning to dislodge the less productive Mironovskaya 808 winter wheat. The average height of its plants is 90-110 cm, or 15-20 cm shorter than the earlier regionalized Saratovskaya 4 variety. Whereas earlier the rye sowings on farms throughout the oblast were reduced to 100,000 hectares, they are now being expanded rapidly thanks to this variety and by the end of the five-year plan they will occupy not less than 300,000 hectares. Over a period of 2 years following regionalization of the variety, our station sold more than 35,000 quintals of Chulpan rye seed to semkhozes throughout the oblast.

Grain Crop Yields at Penza GOSKhOS

Grain Crops	Average for 1976-1980	11th Five-Year Plan			Planned for 1985
		1981	1982	1983	
Winter wheat	28.8	11.2	30.2	39.8	31.2
Rye	25.1	19.0	35.8	40.7	28.9
Spring wheat	20.1	11.3	24.2	27.8	24.4
Barley	23.9	14.1	35.6	35.1	27.2
Oats	29.3	17.6	30.0	38.4	30.4
Millet	14.2	21.8	24.1	33.1	18.8
Buckwheat	6.0	5.1	6.1	4.3	10.8
Peas	19.6	12.5	20.9	22.6	26.6
Vetch	9.7	8.7	10.2	31.3	10.4
Grain crops overall	23.9	14.1	29.1	34.9	27.9

The Gorizont variety of oats, regionalized in 1980, has become the most productive of the group of spring crops. This is a midseason maturing variety that is resistant against lodging and thus it is used in a seed production crop rotation plan as a cover crop for red clover. The first 100 quintals of its seed were sold to semkhozes in 1979. Subsequently, the sales volume increased with each passing year -- 814, 1,200 and 5,651 quintals. Of the grain forage crops, the Nosovskiy 9 barley variety has proven its worth. It is a midseason maturing variety that is resistant against lodging, affected by diseases to only a weak degree and it was regionalized in 1981. Thanks to this variety, we have succeeded in raising the barley yields sharply and in 1982 4,635 quintals of its seed were turned over to the oblast's seed farms.

Millet has become a highly productive crop at the station. A fine variety was regionalized in the oblast earlier -- Mironovskoye 94 -- but it is late-ripening and thus the yield of quality standardized seed was negligible during damp years. For example, during the dry year of 1981 we sold 1,900 quintals of elite seed to semkhozes throughout the oblast and during the damp year of 1982 -- only 50 quintals, despite the fact that the seed yield was high. In 1982, a more rapid ripening variety was regionalized -- Orlovskiy Karlik. It ripens 12-15 days earlier than Mironovskoye 94 and it is resistant against lodging and contamination by smut. Of the 1983 crop, 400 quintals of its seed were delivered to the farms. The oblast's inspectorate for strain testing is carrying out unsatisfactory work in connection with another groat crop -- buckwheat. Over a period of 45 years, only one variety -- Bogatyr -- has been sown. Over the past few years, not one promising variety of this crop has been recommended for production.

The sowings of spring wheat have been reduced unjustifiably -- to 100,000 hectares -- throughout the oblast. Our farms are practically not participating whatsoever in the state procurements of strong and durum wheat grain. Many farm leaders and specialists refer to a lack of good varieties. Yes, a majority of the varieties of the Volga Plant Breeding Center are not being disseminated extensively owing to the fact that they are extremely susceptible to brown rust. Kharkovskaya 2 soft wheat and Bezenchukskaya 139 durum wheat have proven their worth in recent years. Both varieties possess a high resistance against lodging and diseases. They were regionalized in 1982.

Penza Oblast is located in a transitional zone between the arid southeast and damp nonchernozem regions and this complicates the selection of varieties in the face of sharp fluctuations in weather conditions. Grain crops tested here on rich soil during damp years are contaminated by fungous diseases and lodge and during dry years they are not sufficiently drought-resistant. Thus we attempted to solve the problem of soft spring wheat using our own resources.

Here is just one attempt. Senior scientific worker V.N. Romanova, by crossing a hybrid of the NIISKh /Scientific Research Institute of Agriculture/ for the Southeast, Selkirk X Albidum 1541 with Line 19 of the Arin variety (a German variety which at one time was even regionalized), developed the highly productive Surskaya 19 variety, which is resistant to brown rust, loose smut and lodging. It was evaluated by the state committee and considered to be a promising variety in 1984. It will be regionalized in the oblast in 1985.

Surskaya 19 spring wheat is a variety which has white ears, is awnless and has red grain. The leaves are dark green and are characterized by brief silking. The length of the growing season is 100-112 days. According to data supplied by the Central Laboratory for Evaluating the Quality of Tested Varieties, Surskaya 19 is considered to be a strong wheat: the protein content in the grain is 16.5 percent, crude gluten 38 percent, overall glassiness 80-90 percent and its baking evaluation is 4.4 points. Its potential yield is 35-40 quintals per hectare. On the average over a period of 2 years, it surpassed the standard -- Kutulukskaya -- by 1-4 quintals in grain yield at strain testing stations throughout the oblast. A production evaluation is being carried out on nine farms in four rayons. In 1983 it was grown on 310 hectares. In 1982, at the Kolkhoz imeni Lenin in Bessonevskiy Rayon, it furnished a grain yield of 29.3 quintals for each of 50 hectares and in 1983 -- 33 quintals for each of 208 hectares. The seed yield was 4,000 quintals.

Each year the experimental station over-fulfills the task for growing and selling seed of high reproductions. Over the past 10 years, with a slight increase in the sales plan for elite seed from 22,800 to 26,800 quintals, the annual sale of such seed has grown from 35,000 to 53,000 quintals, or an increase of 70-80 percent. A considerable improvement has taken place in the logistical base for the OPKh /experimental model farm/: modern warehouse facilities have been built, including cleaning and drying stations. The seed yield has been raised and the quality of the seed improved. Thus, during the 10th Five-Year Plan and compared to the 8th, an increase of 11 percent has taken place in the production of grain crop seed on the same area and in the sale of such seed -- an increase of 26 percent. During 3 years of the 11th Five-Year Plan, almost two three-year plans for the sale of elite seed were fulfilled.

With the acceptance of such varieties as Chulpan 3 rye (yield of 50-60 quintals per hectare) and Orlovskiy Karlik millet (yield of 30-40 quintals per hectare), the volume of seed deliveries has increased considerably. Just as in the past, the best variety of peas continues to be the more rapid ripening Uladovskiy 8 variety. In 1984 the non-shattering Truzhenik variety was recognized as being a promising one. The sowings of Surskaya 19 spring wheat will increase considerably at the experimental station and this will make it possible to increase sharply the production of its seed. It is hoped that the

regionalization of this variety in the oblast will solve the problem of quality for the grain of the principal food crop.

In the primary elements of seed production for winter wheat, barley, spring wheat, oats and millet, work is being carried out on the basis of individual-family selection, with a two-year evaluation of their progeny.

In the case of winter rye, buckwheat, peas and vetch, the nurseries are being established in accordance with a mass selection plan. The elements of primary seed production are employed in a ten-field crop rotation plan, with alternation of crops: clean fallow - winter wheat - row crops - oats with an undersowing of clover - red clover for seed - spring wheat - pulse crops - winter rye - barley - groat crops. We fertilize the fallow with farmyard manure at the rate of 50 tons per hectare and the remaining fields are given a complete dosage of mineral fertilizer. Spring wheat following a bed of clover has furnished an average grain yield over the past 10 years of 29 quintals per hectare and this was 20 percent higher than the yield from the same crop but following other predecessor crop arrangements.

Specialized farms constitute a weak element in the seed production system. Seed farms, especially newly created ones, are poorly equipped with cleaning and drying points or with mechanisms for the treatment and thermal disinfection of seed. Some farms, when propagating the elite seed obtained from scientific-research institutes, are unable to raise it to the sowing conditions and deliver it to the state as commodity grain. The Penzaselstroy Administration and the Oblmezhkolkhozstroy Association are systematically failing to fulfill their plans for construction-installation work at seed production installations. Thus, there are only a few standard seed storehouses, covered thrashing floors or hard surface sites to be found at specialized farms. Nor can we recognize as satisfactory the degree to which the semkhozes are being supplied with mineral fertilizers, special herbicides and other toxic chemicals.

The experience accumulated over a period of many years reveals that the successful propagation of regionalized and promising varieties of grain crops is dependent to a large degree upon the initiative displayed by farm leaders and chief specialists. Positive results are always achieved in those areas where maximum attention is being given to seed production and where fine work is being carried out with both the land and the seed. For example, over the past 2 years the grain crop yield at the Put K Kommunizmu Kolkhoz in Kuznetskiy Rayon has exceeded 30 quintals per hectare. As a result of the extensive introduction of promising varieties and the development of a scientifically sound farming system, the farm has steadily increased its grain yields from the 7th to the 10th Five-Year Plan respectively: 10.4; 15.4; 19.3 and 24.3 quintals per hectare. This has been largely due to the efforts of the kolkhoz chairman Mikhail Alekseyevich Terekhin.

The honored RSFSR agronomist I.L. Glukhov has worked for a long period of time as the chief agronomist at the Vpered Seed Production Kolkhoz. New varieties of grain forage crops -- Gorizont oats and Nosovskiy 9 barley -- have been disseminated extensively on farms in Belinskiy Rayon thanks to the successful work performed by this enthusiast. The grain crop yield at the kolkhoz exceeds 20 quintals per hectare and each year it is 3-5 quintals higher than the rayon indicator.

This is the second year that the Rodina Radishcheva Kolkhoz in Kuznetskiy Rayon has obtained more than 40 quintals of millet per hectare. The production of seed for grain crops is being carried out in a stable manner at the sovkhozes imeni Ilich, imeni Kalinin and Poimskiy.

We view the following as reserves for further improving the system of seed production for grain crops: specialization of scientific-research institutes in individual crops and varieties, the furnishing of logistical assistance to seed production farms by soviet and party organs and the conversion over to progressive forms for labor organization and wages. Special crop rotation plans, including a system of agrotechnical and organizational measures, must be mastered at each semkhoz. They must be assigned to mechanized brigades and teams operating on a contractual basis, with wages based upon the quantity and quality of seed produced. The scientific workers of the oblast experimental station are constantly furnishing methodological assistance to the farm specialists in improving seed production operations in the zone serviced.

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TILLING AND CROPPING TECHNOLOGY

INTENSIFIED AGROTECHNOLOGY FOR GRAIN CROPS IN PENZA OBLAST

Saratov STEPNYYE PROSTORY in Russian No 6, Jun 85 pp 16-20

/Interviews with Vladimir Fedorovich Nizhegorodtsev, Candidate of Agricultural Sciences and deputy chief of the Penza Oblast Agricultural Administration and Gennadiy Alekseyevich Loginov, chief of the Department of Farming of the Agricultural Administration of the Saratov Oblast Executive Committee; dates and places not specified/

/Text/ The Politburo of the CPSU Central Committee has approved measures for introducing into operations the intensive technology for the cultivation of winter crops and spring wheat. The carrying out of this plan must provide the country with additional millions of tons of grain.

Hundreds of hectares of winter crops in the Volga zone were sown using this technology. But this represents only a portion of the work carried out by the farmers. For the very first time, the sowing of spring wheat was carried out in the spring of this year. During the process of preparing for this important period and also during its course, many questions arose among the farmers which the editorial board is attempting to answer in its articles. The article by RSFSR Deputy Minister of Agriculture B.P. Martynov entitled "Intensive Technologies for the Cultivation of Wheat -- In Production" (Issue No. 3 for 1985) was programmed in this regard. In the next issue, at the request of the readers, the principal elements constituting the intensive technology were discussed.

Today our discussion with oblast agricultural leaders concerns how the farmers prepared for the spring and summer field operations, in accordance with the intensive technology, for the last year of the 11th Five-Year Plan.

Our correspondent met with the deputy chief of the Penza Oblast Agricultural Administration, Candidate of Agricultural Sciences Vladimir Fedorovich Nizhegorodtsev, and asked him to provide answers for several questions.

/Question/ What tasks are presently confronting the oblast's farmers?

/Answer/ Complicated and responsible tasks. The obligations for the current year call for grain and pulse crops to be obtained in an amount not less than 18.8 quintals per hectare, sugar beets -- 160, potatoes -- 100, vegetables -- 120 quintals per hectare. Based upon use of the intensive technology, 40-50 quintals of winter crops per hectare should be obtained from an area of 50,000 hectares, 30-40 quintals of grain per hectare from an area of 200,000 hectares and not less than 25 quintals of spring wheat per hectare from an area of 20,000 hectares.

The realistic nature of the plans in early spring was borne out fully by the satisfactory condition of the winter crops on an area in excess of 600,000 hectares, by the availability of land that was plowed in a timely manner in the autumn and by increases in the amount of organic fertilizer applied and in the volume of mineral fertilizer made available. Long before the commencement of the sowing campaign, many kolkhozes and sovkhoses examined thoroughly their plans for spring sowing and they defined their requirements for personnel, equipment, fertilizers and herbicides. In addition, they sought opportunities for augmenting these materials by means of internal reserves or other sources and for creating all of the conditions required for creative work by the farmers and successful fulfillment of the socialist obligations.

In a majority of rayons throughout the oblast, the autumn supplies of moisture in the soil were less than or close to the average values established over a period of many years. In the one meter layer of soil on autumn plowed fields, they ranged from 59 to 172 millimeters and on winter crop fields -- from 72 to 159 millimeters.

Deep freezing (in January the soil froze to a depth of 80-100 centimeters and in some areas -- to 120-140 centimeters, instead of the average of 30-60 centimeters established over a period of many years) caused weak absorption of the thaw waters and a raised surface runoff. Thus a shortage of productive moisture was experienced on a majority of the fields. This circumstance raised a need for attaching special importance to moisture conserving methods of pre-sowing soil cultivation, to optimum sowing schedules and to the sowing norms for agricultural crops.

/Question/ Under your conditions, what are the principal elements of the intensive technology for the cultivation of wheat?

/Answer/ Here we assign a priority to winter wheat. A chief condition for high reliability and effectiveness in its cultivation using the intensive technology is its placement following clean fallow. This assumes the thorough and timely carrying out of all operations concerned with the working of fallow. We begin this work with shallow plowing immediately after the predecessor crop has been harvested. Farmyard manure is applied 2-2.5 weeks following the shallow plowing and thereafter plowing is carried out to a depth of 28-30 centimeters. In the spring, at the moment of physical soil ripeness, we harrow in two tracks crosswise or diagonally to the direction of plowing. Cultivation is carried out depending upon the appearance of weeds and with a mandatory reduction in depth during subsequent workings. If the farmyard manure is applied in the spring, then replowing should be carried out to a depth of 20-22 centimeters, with simultaneous harrowing and packing of the soil. The

last cultivation is carried out to a depth of 7-6 centimeters immediately prior to sowing.

In our oblast, just as throughout the zone as a whole, tremendous importance is attached to the accumulation of moisture in the soil as a result of winter and spring precipitation and to protecting the plantings against winter-kill. Thus the carrying out of snow retention work is considered to be a mandatory agrotechnical measure. We drew the conclusion that a summer sowing of a windbreak strip on clean fallow is most effective here. Ideally, sunflowers should be used as the windbreak crop. It should be sown in one or two lines during the period from 15 to 20 July. The distance between the windbreak strips is 8-12 meters and their direction -- crosswise to the prevailing winds during the winter.

A high yield of winter wheat with fine quality grain (we have a monopoly on Mironovskaya 808) is possible only when there is an optimum nutrient level in the soil. In order to obtain a yield of 40-50 quintals per hectare, there must be 12-15 milligrams of P_2O_5 and K_2O per 100 grams in the arable layer of the chernozem soils. In order to raise the per milligram content of these elements, 60-80 kilograms of mineral fertilizer must be applied per hectare. The norm for applying farmyard manure must be calculated per hectare of crop rotation arable land. For farms in the oblast's first and second zones, it must be not less than 5-7 tons per hectare and for the third and fourth zones -- 8-12 tons per hectare.

On a fallow field, the entire computed dosage of phosphorus (with the exception of 10-15 kilograms of P_2O_5 , intended for row placement during sowing) and potassium is applied. On soils characterized by a weakly acid or average acid medium reaction, use should be made of phosphorite meal. Liming should be carried out on more acid soils. The optimum medium reaction for winter wheat is neutral or weakly alkali ($pH = 6.5 - 7.3$).

When determining the norms, consideration should be given to the quantity of nutrients which the plants can utilize separately from the soil and fertilizers (see Table 1).

The mineral nitrogen content in the soil is determined immediately prior to the commencement of growth in the winter crops, roughly one week prior to the carrying out of the first top dressing (see Table 2).

A forecast for the quality of the grain can be provided using the method of tissue diagnosis. The detection of nitrate nitrogen is based upon its color reaction with diphenylamine. The nitrogen concentration in plants is determined according to the intensity of coloration of the juice. Tissue diagnosis is conducted during the shooting phase. From crops intended for the production of strong and valuable grain, 100-120 plants are selected at 20-30 points along a field diagonal upon the commencement of the shooting phase; from this number, three average samples are prepared each consisting of 20 productive plants. From each stalk, at a point that is 10-15 millimeters higher than the second node, a section that is 1.5-2.0 millimeters thick is snipped off at an angle of 45° using a razor blade. It is placed in a glass dish and thereafter 1 drop of a 1 percent solution of diphenylamine is applied. Subsequently another glass

TABLE 1

Approximate Computation of Fertilizer Dosages for a Planned Winter Wheat
Yield of 50 Quintals Per Hectare for an Arable Layer Depth of 30 cm

	N	P ₂ O ₅	K ₂ O
Withdrawal per quintal of grain and corresponding amount of straw, in kg	3.2	1.0	2.5
Overall withdrawal, kg per hectare	160	50	125
Content in the arable layer, milligrams in 100 grams of soil	5	6.1	5
Nutrient supplies in the arable layer (mg per 100 grams X 30 cm)	150	183	150
Coefficient of utilization of NPK from soil, in %	25-30	10	10-15
Can be used from soil, kg per hectare	45	18	23
Should be applied with fertilizers, in kg	115	32	102
Supplied with organic fertilizers (35 tons per hectare), in kg	175	87.5	210
Coefficient of use of nutrients from farmyard manure during first year, in %	25	20	50
Can be used from farmyard manure, kg per hectare	44	18	105
Should be applied with mineral fertilizers, in kg	71	14	-
Coefficient of utilization of nutrients from mineral fertilizers, in %	50-60	25-20	60-70
Mineral fertilizer to be applied taking into account the coefficient of utilization, kg of active agent	120	50	45-60

Note: The indicators for the content of mobile nutrient forms are taken from the "Agrochemical Passport for a Field," which must be prepared based upon analyses of soil samples from a specific field, on which wheat is being grown using the intensive technology. Even in the presence of a high level of potassium, an application of it with mineral fertilizers in a dosage of from 45 to 60 kg per hectare is mandatory for the purpose of improving the utilization of nitrogen and phosphorus by the plants.

dish is placed on top and light pressure is employed to force out juice. The color obtained is compared against a scale and the average grade determined. If it is lower than 3.5, a top dressing is not considered advisable, since it will be impossible to obtain strong or valuable wheat; a grade of 3.5-4.5 indicates a requirement for two top dressings (each 30 kg per hectare), with the first being applied during the heading-blossoming phase and the second -- during the grain formation phase; a grade of 4.6 to 5.5 indicates a requirement for one top dressing; a grade in excess of 5.5 -- a foliar top dressing is not considered advisable, since strong wheat grain can be obtained without an additional fertilizer application. A foliar top dressing is carried out using urea.

In order to raise the shooting energy and germinative capacity of freshly harvested seed, which we use for sowing, it should be subjected to hot air warming by means of sunlight. Prior to sowing, the seed must be treated against the occurrence of smut diseases. In Penza Oblast, winter wheat suffers mainly from covered smut and root rots; in a campaign directed against these diseases, use can be made of Unysh (9 kg per ton), Granozan (1-2 kg per ton), Hexatiuran

(2 kg per ton), Pentatiuran (1.5-2 kg per ton) and Pentasol (2 kg per ton). Seed treatment is carried out with moistening (7-10 liters of water per ton of seed) and adhesives (silicate glue -- 0.2 kg per ton, sulphite-alcohol malt-residue -- 0.5 kg per ton, skim milk 1.5 kg per ton, flour paste 0.1-0.2 kg per ton, molasses 0.5-1.0 kg per ton. When Granozan is used in a working solution, the retardant TUR (3-4 liters per ton) can be added, with water at the rate of 6-7 liters per ton. Adhesives need not be added when TUR is used. TUR prevents the lodging of winter wheat and it also raises its winter hardiness and drought resistance.

TABLE 2
Computation of Nitrogen Dosages for Winter Wheat Top Dressing

Planned Yield, quintals per hectare	Supply of Mineral Nitrogen in the 0-40 cm Layer in the Spring, kg per hectare		Dosage, kg Per Hectare	
	Optimum	Actual	First Top Dressing	Second Top Dressing
35	90	40	50	-
45	120	60	60	-
50	140	70	70	-
55	160	80	40	40
55	160	200	Not carried out or 20 kg per hectare applied	

Note: The first top dressing must be applied during the tillering phase and the second during the shooting phase. The top dressing dosage is defined more precisely based upon the results of plant diagnosis. The optimum nitrogen content in winter wheat leaves during the tillering phase is 4.9-5.5 percent and during the shooting phase -- 3.9-4.5 percent for dry substance.

In a campaign against root rots, the pre-sowing dusting of seed with the biopreparations Trikotetsin (2 kg per ton) and Phytobacteriomycin (3 kg per ton) is effective.

Under our conditions, the optimum sowing period following clean fallow is from 20 to 25 August. The sowing is carried out using the narrow row or row method, with the technological tracks remaining for the passage of crop tending equipment. When all of the agricultural methods are observed, the number of passes by agricultural machines during the growing season and over the tracks will reach seven. The sowing is best carried out using a triple unit sowing machine. In order to leave unsown strips for a track of 1800 mm, which corresponds to the track for fertilizer application machines, sowing units 6,7,18 and 19 of the sowing machine following the tractor should be disconnected. A cultivator tooth or a small harrow for loosening the soil should be installed in the tractor's track and in front of the sowing machine.

Thus, regardless of the structure of the unit, the distance between the tracks will be 10.8 meters. The sowing norm -- 4.5-5.0 million germinative grains per hectare, with a simultaneous application of 15-20 kg of active agent granulated superphosphate. Following sowing, the soil is packed using ring rollers.

In order to reduce the moisture losses through evaporation and improve the nutritional, air and thermal regimes, the winter crop sowings should be harrowed in the spring when the soil is physically ripe. On heavy textured soils, it should be carried out crosswise to the sowing direction in two tracts and on light textured soils -- in one track.

The complex of measures for providing protection against diseases and pests also includes treating the crops repeatedly with toxic chemicals. In a campaign against the frit fly (when there are six larvae per 100 stalks), spraying is carried out using Chlorophos (1-2 kg per hectare) or Metaphos, 20 percent k.e. (1-2 liters per hectare). For suppressing brown rust during the heading phase, spraying is carried out using Sineb (3-4 kg per ton), Polycarbatsin (5 kg per hectare), Bayletono (0.5-1 kg per hectare) or Anilat (5-10 kg per hectare). When 5-10 greenbugs are observed on an ear, the plantings are sprayed using Phosphamide (0.7-1.5 liters per hectare) and when there are 2 larvae or 1.5 pentatomids per square meter -- Chlorophos (0.75-2 kg per hectare) or Vofatox (0.7-1.4 kg per hectare). These preparations are also used for combating leaf beetles (when 0.1-0.5 larvae are observed per plant) and wheat thrips (40-50 specimens per ear). In the spring, after the snow has disappeared, a campaign is waged against mouse-like rodents using poisonous bait containing Bacterodentside (1-2 kg per hectare), when there are more than 20 inhabited lairs per hectare.

Naturally, the harvest work must be carried out rapidly and without losses. The harvest methods are dependent upon the prevailing weather conditions and the status of the crops.

In the complex of work associated with the cultivation of winter wheats, one important element is that of determining the grain gluten content prior to harvest. A preliminary evaluation of the quality of the grain is carried out by the farm agronomists and specially trained laboratory workers. Subsequently the laboratories of the grain receiving enterprises determine the gluten content after the crop has been threshed. Grain samples are selected for this purpose directly from the thrashed heaps on the farm thrashing floors. A final analysis of quality is carried out when the batches of grain reach the grain receiving enterprises and the results of such analysis serve as the basis for monetary calculations.

Question And what about spring wheat?

Answer It is planted following winter crops, corn, sugar beets and less often following pulse and spring grain crops. For use of the intensive technology in cultivating spring wheat, importance is attached not only to the predecessor crop arrangement but also to the schedules and methods for carrying out the principal soil cultivation. The best predecessor arrangement is obviously winter crops, after which fall plowing must be carried out early according to the type of bastard fallow. Such fields were determined in advance for the 1985 harvest. Sugar beets is also a fine predecessor crop. However, sugar beet plantings must be free of weeds and the crop must be harvested in a timely manner.

• Soil cultivation following winter crops must include: immediately after the harvest -- plowing with simultaneous harrowing; cultivation for the destruction

of weeds in the autumn; filling of holes on erosion-prone slopes; plowing to a depth of 18-20 cm following sugar beets and potatoes, or if the soil moisture condition permits, processing the field to a depth of 14-16 cm using a heavy disk harrow.

Pre-sowing cultivation includes harrowing when the soil is physically ripe and cultivation to 6-8 cm with harrowing, which should be carried out immediately following the harrowing. Thereafter, the sowing is carried out. Post-sowing working of the soil -- packing. All operations should be carried out without the slightest interruption.

Spring wheat imposes high requirements with regard to the fertility of the soil. It is capable of furnishing high yields on soils of a neutral or weakly-alkali reaction.

The same "Agrochemical Passport for a Field" or agrochemical cartograms serve as an initial source of information for the liming of soils and for computing the dosages for applications of mineral fertilizer. Such sources should not have been prepared more than 5 years ago. An average of 4.5-5 kg of nitrogen, 1-1.5 kg of phosphorus and 2.5-3 kg of potassium are required for the production of 1 quintal of spring wheat grain. The gross requirement per hectare for a yield of 40 quintals per hectare is 190-200 kg of nitrogen, 40-60 kg of phosphorus and 100-120 kg of potassium. Overall, the amount of accessible nutrients in the soil and the fertilizers applied must conform to the withdrawal of nutrients, according to the planned yield, or even exceed it by 15-20 percent.

When determining the nutrient supplies in the soil (kg per hectare), use should be made of the following coefficients: for sandy and medium loam chernozems -- 25, heavy loam and clay soils -- 27, on which the nutrient content multiplies in milligrams per 100 grams of soil (indicators of the agrochemical passport).

Under our conditions, the following varieties can be grown using the intensive technology: Kutulukskaya, Kharkovskaya 2 and Saratovskaya 36 soft wheats; Kharkovskaya 46, Bezenchukskaya 139 durum wheats. The seed must meet the requirements for 1st class of the sowing standard. In addition to determining the germinative capacity, purity, moisture content and weediness of the seed, all of the seed must be checked for growth energy and the best batches selected for sowing. The sowing norm for soft wheat on chernozems -- 5.0-5.5, durum wheat -- 5.5-6.0 million germinative grains per hectare. The best sowing methods -- narrow row and crossed. The depth of seed placement -- 6-8 cm. A constant technological track is used for ensuring quality and uniformity in applying top dressings and pesticides during definite phases of plant development.

Spring wheat suffers to a large degree from early annual (wild oats, black bindweed and others) and also from perennial root sucking (sowthistle, bindweed, spurge and others) and rhizome weeds.

It is recommended that Carbin and Suffix be used for combating wild oats. For combating dicotyledonous weeds -- 2.4-D derivatives. For young and root sucking weeds, use should be made of the systemic herbicides 2.4-D and 2M-4X during the tillering phase for spring wheat.

During the period from seedlings to tillering, along the edge strips of spring wheat sowings, when there are more than eight specimens of grain fleas (*Phyllotreta vittula*) per square meter, dusting with GKhtsG (Hexachlorocyclohexane) is carried out using a 12 percent dust (10-12 kg per hectare) or spraying with Vofatox (0.7-1.4 kg per hectare). When an increase takes place in the number of leaf beetles (more than 40-50 beetles per square meter) during the shooting to heading period, the wheat sowings are sprayed with Chlorophos (0.75-2 kg per hectare) or Vofatox (0.7-1.4 kg per hectare) and when there are more than 10 greenbugs per ear -- spraying with Phosphamide (BI-58) at the rate of 0.5-1.0 liters per hectare.

During the summer, with the appearance of brown rust pustules, the spring wheat sowings are treated with a suspension of Cineb (3.5 kg per hectare) of Anilate (10 kg per hectare). The consumption of working liquid for wheat -- 200-400 liters per hectare with ground spraying.

All of the factors mentioned above have undergone a check on all farms throughout the oblast. But the industrial technology, which has been combined into a single system, is only beginning to be introduced into operations on an extensive scale in regions considered to be more favorable from the standpoint of soil conditions. Obviously, there are many difficulties -- objective, subjective and of a psychological nature. I believe that it makes sense to return to this discussion and to "count the chickens" in the autumn.

* * *

The winter crops in Saratov Oblast were sown using the intensive technology and the sowing of spring wheat was carried out in an organized manner.

Our correspondent met with the chief of the Department of Farming of the agricultural administration of the oblast executive committee Gennadiy Alekseyevich Loginov, who stated:

The workers in our oblast, as written in the decree of the CPSU Central Committee concerning the work of the Saratov Oblast CPSU Committee, are confronted by a great task -- to make up for lost time and to carry out the production plan for high quality grain of strong and durum wheat. For solving this task, the gross yield of this wheat should be increased by expanding the sowing area and increasing the yields.

The goal of the intensive technology is to ensure considerable growth in yields and to bring about an improvement in the quality of the grain. This is why the decision was made this year to allocate 59,000 hectares of arable land for the sowing of spring wheat using this technology. Of this amount, 54,800 hectares were to be used for durum varieties and 4,200 hectares for strong varieties.

Durum wheat was planted in 19 of the oblast's rayons. The largest areas are concentrated on the left bank of the Volga River -- in the most favorable rayons from the standpoint of soil-climatic conditions -- Dergachevskiy, Ivanteyevskiy, Pitserskiy, Perelyubskiy and Pugachevskiy.

We hope to compensate for the shortage in strong wheat grain by means of winter crops. The decision was made to allocate 4,200 hectares for testing strong

spring wheat, with use being made of the new technology. The principal fields will be located in Atkarskiy, Balashovskiy, Yershovskiy and Sovetskiy rayons.

Question Prior to the commencement of the spring sowing campaign, what was done in the interest of ensuring the successful introduction of the intensive technology for spring wheat?

Answer Where necessary, all of the farms were allocated mineral fertilizers at the rate of 80 kilograms for each hectare of sowing, including nitrogen and phosphorus fertilizers -- 40 kg per hectare. Herbicides and toxic chemicals were also made available in sufficient quantities.

On the farms, an agrochemical passport was prepared for each field, which listed an entire complex of operations to be carried out during the cultivation of the wheat.

Question How is work carried out using the intensive technology different from conventional operations?

Answer Earlier, we carried out the following operations when cultivating spring wheat: autumn plowing, snow retention work in the winter, cultivation and harrowing in the spring and thereafter we carried out the sowing work. Here the work ended. There was almost no tending of the crops throughout the summer. Now, based upon the requirements embodied in the technology, we have developed 16 measures which we must carry out during the growth period and throughout the ripening of the grain of cereal grain crops. They are all recorded in the technological tables, the schedules for carrying out the measures have been defined and the chemical agents and times for applying them are indicated in accordance with the developmental phases for the wheat.

All of these technological measures have been combined into a definite system. The tables have been printed, reproduced and distributed to all of the brigades and teams and farm agronomists and leaders throughout the oblast.

Question What are these measures?

Answer We began our work involving use of the intensive technology for spring wheat during the month of March. At this time, incrustation of the seed was carried out using polyvinyl alcohol at the rate of 0.5 kilograms per ton. Prior to sowing, the soil herbicide Trialate (Avadex) was applied at the rate of 2.5 liters per hectare. A technological track was created during the sowing work. Phosphorus-containing fertilizers were applied to the drill rows simultaneous with the sowing. During tillering, the plantings were sprayed with 2.4-D ammonia salt in a dosage of 2.0 kg per ton in order to combat weeds. In April and May (seedling-tillering period), the grain leaf beetle was destroyed in the plantings using Metaphos at the rate of 1 kg per ton of solution. In May the same solution in the same dosage was used for treating the seedlings against stink-bugs. The reasoning was as follows: if the spring period was dry, spraying would be carried out when there were 0.3-0.5 specimens per square meter and if a damp spring -- when there was one or one and a half specimens. In May the plantings were also treated during the tillering-shooting period against brown rust, with use being made of Sineb (4.0 kg per ton) and subsequently -- the TUR preparation in the same dosage.

We conduct a tissue diagnosis at the commencement of the shooting stage. In June, during the heading stage, we again treat the wheat against brown rust using Sineb (4.0 kg per hectare) or Tilt (0.5 kg per hectare). Thereafter we apply a top dressing to it using Carbamide (30 kg per hectare) or Carbamide together with ammonium nitrate (22.0 + 8.0 kg per hectare).

In June and July, during the heading - blossoming period, importance is attached to carrying out a treatment with Metaphos or Chlorophos when two specimens of stink-bug larvae are observed per square meter and corn weevils -- 4-5 per square meter. During the period of grain formation, the plantings should be given a top dressing of carbamide or carbamide with ammonium nitrate. This will be a second top dressing, with the same dosage as the first being used. Thereafter, during the period of grain formation and waxy ripeness, the plantings are treated once again with Sineb or Tilt against brown rust. And the last measure -- during the period of waxy grain ripeness -- to carry out a preliminary evaluation of the quality of the grain. Thus, during the summer period and coincidental with the introduction of the intensive technology, the machine operators must carry out not less than two treatments on their spring crop plantings against the stink-bug and brown rust, two foliar top dressings for the wheat and a number of other measures.

All of these treatments will be carried out using the ground method and with the aid of sprayers which will be moved along the technological track.

Question Could you not provide some information as to how and where the specialists and machine operators are able to familiarize themselves with the new operations?

Answer Over the past winter, all of the chief agronomists and chief engineers of rayon agricultural administrations, kolkhozes and sovkhoses throughout the oblast, the chairmen of Selkhozkhimiya associations, the leaders of base farms and the chiefs of administrations undertook a 40 hour program of instruction in the intensive technology at an oblast school for improving skills.

Scientific workers from the Elita Povolshya NPO Scientific Production Association and specialists attached to the oblast's agricultural administration participated in this instruction. For their part, leaders at the rayon level and the chief specialists of farms made their knowledge available to the machine operators, brigade leaders and agronomists. The students were given examinations following exercises during oblast and rayon courses.

The intensive technology was employed for sowing winter crops on 62,000 hectares. For the most part, this consisted of strong Mironovskaya 808 wheat. In some areas, the planned yield amounted to 40-50 quintals per hectare. This was 20-25 quintals more than the usual yield. Moreover, winter crops were sown following clean fallow on 619 hectares.

Commencing this year, we introduced a new innovation for working fallow and maintaining it in clean condition. We borrowed from the experience of the Stepnoy Sovkhoz in the Kalmyk ASSR, where blade working organs were employed on cultivators for working fallow. During the winter, 16,000 such blades were produced in the workshops of rayselkhoztekhnika, kolkhozes and sovkhoses.

In addition, we adopted the Bashkir experience in the application of mineral fertilizers. Ten thousand devices were prepared for inclined-belt applications of solid granules, with the units being installed on SZS-2.1 stubble sowing machines.

Wide-swath units were produced for spraying the crops with herbicides.

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FORESTRY AND TIMBER

BUSYGIN ON TIMBER INDUSTRY DEVELOPMENT, TASKS, GOALS

Moscow SOTSIALISTICHESKIY TRUD in Russian No 9, Sep 85 pp 31-39

[Article by M. I. Busygin, USSR minister of the timber, pulp and paper and wood processing industry: "The Forest—Our Wealth," "Use Its Resources More Efficiently"]

[Text] M. I. Busygin, USSR minister of the timber, pulp and paper and wood processing industry, responds to questions from SOTSIALISTICHESKIY TRUD.

[Question] Last year the CPSU Central Committee and the USSR Council of Ministers adopted the decree "More Efficient Use of Forest Resources." Please tell us, Mikhail Ivanovich, what this decree means for the development of our national economy.

[Answer] The growth of our national economy and our ability to meet consumer demand for the products of our industry depend to a great extent on the efficiency with which we exploit the resources of our forests. The decree devotes particular attention to the need to increase the efficiency of our production operations and to improve the quality of our products, to insure complete utilization of raw timber resources, cut losses of these resources sharply, continuously increase the productivity of our labor, strengthen the cost-accounting system and to improve the quality of logging and forest management operations.

It should be pointed out, however, that the industry has by no means performed poorly in these areas. The product sales plan for 1984 was overfulfilled by 48.5 million rubles, above-plan timber deliveries reached 111,000 m³, and 68.6 million m² of newsprint and furniture valued at 206.3 million rubles were produced above and beyond targets specified in the plan. At the same time, labor productivity reached the level targeted for the end of the five-year-plan period. And we cut production costs by 61.4 million rubles.

The industry did, however, fail to reach a number of plan targets. These shortfalls were in the areas of commercial timber, sawed timber, railroad tie, processed pulp, wallboard and prefabricated wood house production. Nor was the plan for contract deliveries of wood and paper products to consumers fulfilled. Industry officials are now engaged in an intensive effort to rectify this situation.

The decree has posed the industry some enormous tasks in terms of both scale and direction. The ministry has developed a program of measures designed to accomplish these tasks and has already begun to implement them. All organizations within the industry have undertaken a critical review of their operations, revised both their short- and long-term objectives and have outlined programs aimed at both increasing and improving production. Our requirement this year is to achieve an above-plan increase in labor productivity of 1 per cent and a corresponding decrease in production costs of 0.5 per cent and to operate at least two days on resources freed up by resource-saving measures. Now these figures may not look too impressive at first glance. If you do a little calculation, though, you'll find that by achieving economies in materials consumption corresponding to the requirements for two days of operation, our industry is presenting the national economy with, for example, 0.7 million m³ of timber, 65.3 million rubles' worth of materials and 136.7 million kWh of electricity. And just as we had undertaken to do, by the 40th anniversary of the victory we had delivered 108 million m³ of timber, which is 51 per cent of our annual volume. We have now resolved to meet the five-year target for consumer goods production, furniture, for example, by the 68th anniversary of the Great October.

The Twelfth Five-Year-Plan period will see Minlesbumprom SSSR [USSR ministry of the timber, pulp and paper and wood processing industry] jointly with Gosleskhoz SSSR [USSR State Committee on Forest Management] implement a number of important measures aimed at insuring fuller and more efficient exploitation of the logging area. Steps are being taken to increase production of rough timber through rational systems of timber dressing and grading. We need to substantially increase the number of continuously operating integrated enterprises engaged in reforestation, logging and complete timber processing, particularly in areas with only limited timber resources and in the zones of operation of our major wood-processing enterprises. We are also concerning ourselves with the need to eliminate countermovements and superlong hauls of wood products over ministry of railroads lines and with efforts to move our products more efficiently by truck, ship and mixed forms of transportation. We are implementing a program of measures designed to consolidate and enlarge our lumber off-loading facilities, improve mechanized cargo handling systems and upgrade work performance at rail line timber storage points.

Most importantly in my view is the fact that this party and government decree has given a powerful new impetus to our efforts. This year alone has seen industry workers undertake to achieve substantial increases in commercial lumber production, process 30 million m³ of wood waste and double chip production directly on site in the logging area itself. During this final year of the five-year-plan period we also plan to work for substantial reductions in freight car idle time, cut inefficient freight movements by 550 million t·km and increase stacked timber shipments 500,000 m³ over the figure for last year. Together with the ministry of railroads we are striving to insure complete deliveries to consumers. So as you can see, we've got a lot of work ahead of us.

[Question] The decree refers to the need to concentrate production and increase the specialization of our logging and wood processing enterprises. What steps is the industry taking in this direction? What is it doing to improve the managerial structure and the organization of labor and production?

[Answer] At the present time some 60 ministries and departments are engaged in cutting the country's timber. This situation makes for inefficient exploitation of the logging area, reduces the raw material base of enterprises of the country's primary logger, USSR Minlesbumprom and cuts down their operating time. Logging enterprises are forced to lead a "nomadic" existence and to transfer operations to more remote areas which have yet to be developed for logging operations. This in turn results in inefficient movements of the timber harvested and a great many other negative situations.

Poorly equipped as they are with modern facilities and equipment, the small enterprises of the organizations which do their own logging will as a rule be found to operate at a fairly primitive level, giving no consideration to the manpower, material and financial costs involved. They will harvest only the timber which can be sawed and leave the rest in the forest. It costs them almost twice as much to cut and move 1 m³ of wood as it does the specialized enterprises of our industry. This is why the CPSU Central Committee and the USSR Council of Ministers have proposed that by 1990 all logging and transport operations be concentrated primarily in the hands of enterprises and associations of the ministry of the timber, paper and pulp and wood processing industry in areas where this ministry is the primary logger, that is, in the northern part of the European USSR, the Urals, Siberia and the Far East.

Together with industry scientific research institutes, ministry officials have developed a program of measures to implement this proposal. These measures call for the consolidation of logging and wood-processing enterprises, the elimination of small, economically inefficient facilities and plants, efficient utilization of the logging area and waste wood and qualitative improvements in the production engineering and manpower organization areas.

We anticipate that as early as the end of the current five-year-plan period the average logging settlement will have over 1000 residents. This will make it possible to develop a social infrastructure which will to a much greater degree than heretofore satisfy the social, cultural and personal needs of industry workers and their families, provide our enterprises with stable, well-qualified workers, cut down the turnover in the work force and raise labor productivity.

Our many years of experience with the operation of integrated timber enterprises in a number of areas of the country point to the possibility of achieving greater flexibility in manipulating productive resources, exploiting the wealth of our forests more efficiently and of introducing effective nonwaste technology.

With the objective of providing the pulp and paper industry with a reliable supply of raw material, we think it would be a good idea to develop large, specialized tracts of forest in a number of areas to provide a continuous supply of wood for chemical treatment and processing.

[Question] Efficient exploitation of the resources of our forests is going to require a better, stronger system of cost-accounting. What is the ministry doing in this direction? What attention is it giving to the task of introducing a system of brigade-level cost-accounting?

[Answer] In implementation of the CPSU Central Committee decree "Developing and Improving the Effectiveness of the Brigade System of Manpower Organization and Work Incentives in Industry," the ministry has outlined and is implementing measures aimed at accomplishing these objectives. It is introducing a system of progressive production norms, standards governing operational procedures and model schemes of manpower organization, reorganizing work places on the basis of the certifications involved to make them more efficient and improving the wage and bonus system. A result of these efforts has been a more than 16 per cent increase in labor productivity within the industry over the course of the first four years of the five-year-plan period. One-third of this increase can be attributed to improvements in the organization of the work force.

Now at work industrywide are more than 93,000 production brigades accounting for over 1 million of our workers, or three-fourths of the total industry work force. A new type of brigade has been created here, one which works in accordance with a single work authorization and then gets paid on the basis of what they actually accomplish based on the KTU [expansion unknown].

As of the beginning of 1985, more than 30 per cent of our brigades were operating on a cost accounting basis, which constitutes the basis for the subsequent transition to the collective contract system. In view of the nature and importance of the organizations within the industry engaged in basic logging operations, it will be brigades operating in the forests themselves which will be the first to make the transition to the contract system. Analysis shows that brigades cut losses of work time by 5-15 per cent, raise labor productivity 10-20 per cent, achieve substantial economies in their consumption of material resources and make better use of the areas they log. In the case of the Udmurtles Association's Pastukhovskiy logging organization, for example, where all brigades have been placed on a cost accounting basis, the logging plan for 1984 was fulfilled to the tune of 138 per cent, production per machine-shift reached 105 per cent of the target figure and economies in the consumption of fuels and lubricants totalled 24,000 rubles. Workers received 5600 rubles in bonuses.

The Arkhangel'sklesprom, Krasnoyarsklesprom, Kirovlesprom and Tomlesprom associations harvest 70 per cent of their timber on a brigade contract basis, while in the case of the Omskles and Udmurtles associations the figure is even higher—over 80 per cent.

The ministry's construction brigades perform 50 per cent of all their construction and installation work on the basis of brigade contracts. The average annual output per worker in the construction brigades operating on a cost accounting basis is 30-40 higher than that of workers in brigades not on the cost accounting system. Last year, 1984, saw the cost of construction operations come down 1 million rubles due to the rise in labor productivity in the contract brigades.

Enterprise workers are rewarded for economies achieved in the consumption of material resources by full utilization of raw and other materials, reducing specific resource consumption norms and by cutting losses and waste in production. This doesn't mean, of course, that these economies should be allowed to degrade the quality of the product. Bonuses for economies achieved in one area of production or another will characteristically be paid without consideration of material consumption levels for the particular enterprise as a whole or of the extent to which

plan targets are achieved in other technical and economic categories. To this I would add that bonuses for economies in material resource consumption and for achieving progressive norms governing consumption of these resources are paid to workers in amounts greater than the maximums established for the industry and to engineering and technical personnel in amounts exceeding the maximum set for bonuses paid for basic work performance. The total amount of the bonus which may be paid a worker can be 75 per cent of the monthly wage or of a quarterly salary.

[Question] At the end of last year the CPSU Central Committee discussed the problem of serious shortcomings in the use of secondary material resources within the national economy. The decree adopted in this connection points to particularly serious deficiencies in efforts to solve this problem in, among others, USSR Minlesbumprom. What is the industry doing in the way of introducing low-waste and waste-free technologies and processing systems which make full use of raw and other materials? What kind of incentives are in place to encourage steps in this direction?

[Answer] Our forests are a national asset in the possession of the Soviet people. Unlike other raw material resources, the "green storehouse" is capable of replenishing itself and multiplying its riches provided we make proper, judicious use of them. Modern-day technology is making it possible to obtain valuable products from the entire biomass we harvest, that is to say, to make use of everything which up until relatively recently (and in some places still does even today) used to go to the dumps or be left in the logging area. One of the primary indicators characterizing this process is the level of production of new wood products (wallboard, cardboard, industrial chips) as substitutes for industrial wood.

While commercial wood substitutes used to account for less than 20 per cent of total raw wood resources, last year saw this figure climb to 35 per cent. I think it should be clear why an effort to achieve major increases in the production of effective commercial wood substitutes with only limited increases in the amount of timber we harvest is one of the key tasks of the industry. To make complete use of all the wood waste we generate is a top-priority task for the workers of the industry, as well as for other wood consumers and processors.

The ministry has formed a coordinating committee on the utilization of secondary raw wood materials, which is developing what will be a regional system of collecting and processing raw wood materials unused locally regardless of the departmental subordination of the enterprises which harvest and process the timber in the first place.

Our leading enterprises are now making 90-92-percent use of their raw wood. In view of the fact, however, that figures like these still can't be reported throughout the industry, the criticism which has been levelled against us has been justified. Enterprises of the Tomlesprom, Tyumen'lesprom and Krasnoyarskleseksport associations, for example, are utilizing only 62 per cent of their wood.

Unused waste wood is nevertheless accounting for a good share of the raw material used by our sawmills, in the furniture and plywood-manufacturing industries and in the fabrication of containers. The CPSU Central Committee decree on the experience enterprises of the Yugmebel' and Tsentromebel' all-Union industrial

associations and the Kievdiv Production Association have had with efforts to make fuller industrial use of secondary raw wood materials and waste wood from logging and wood-processing operations is aimed at the objective of better utilization of these waste products. Enterprises in these associations have introduced no-waste wood-processing technologies and modernized equipment to fabricate wallboard using less material. A major effort has been undertaken to collect waste wood from enterprises and organizations of other ministries and departments engaged in wood-processing operations. With only minimal expenditures in money and manpower, 1.5 million m³ of secondary raw wood products have been put to use in industry since the beginning of the five-year-plan period. This equates to a saving of more than 30 million rubles. These associations are successfully meeting plan targets, consistently increasing their output of consumer goods, expanding the range of their products and improving product quality.

The party central committee has endorsed the experience these associations have gained and recommended it for general adoption. To this end the industry has outlined a program of measures aimed at more efficient utilization of waste wood and low-grade timber for industrial purposes for 1985 and then for the period extending to 1990.

With the objective of providing material incentives for workers to meet plan targets for waste wood utilization (collection and processing), new indicators reflecting fulfillment of mandatory quotas for waste wood processing have been added to the regulation governing bonus awards for overall work performance. Utilization of waste wood will now be treated as one of the most important factors in determining recipients of bonuses from the bonus funds as well as of the cash awards for overall work performance for the year.

At the discretion of the ministry, managerial personnel of the all-Union and production associations can be awarded increases in their bonuses of up to 25 per cent for achieving waste-wood utilization targets. On the other hand, when targets are not achieved, the individuals in this category may forfeit their bonuses either entirely or in part, just as in the case of shortfalls or deficiencies in production.

To finance bonus payments to workers engaged in the fabrication of products from waste wood, up to 50 per cent of the savings achieved as a result of the use of waste wood rather than the more valuable timber is paid into the material incentive fund. Maximum figures have been established for the share of savings achieved for specific categories of material resources (timber, fiberboard, particle board, plywood, veneer sheet, paper, cardboard, pulp, chemical materials, reagents, polymers, precious and nonferrous metals etc.) which can be paid into the bonus fund.

So together these two categories of measures—the organizational and technical measures and the system of material incentives—have been introduced with the objective of encouraging fuller industrial utilization of secondary raw wood material.

[Question] Paper production, as we know, keeps increasing from one year to the next, but there's still never enough, particularly of newsprint. What steps are being taken to solve the problem of increasing paper production, expanding the

assortment available and improving the quality of the product, particularly in the way of material incentives for the workers?

[Answer] The pulp and paper industry has made great strides forward over the past 20 years. The construction of new and the expansion of existing enterprises have enabled it to increase pulp-making capacities 3.6-fold, those for paper 2.4-fold and for cardboard 3.5-fold. It has organized to produce new products as well, products such as, for example, acetate and cord rayon pulp, industrial paper for the electronics, electrical equipment, aircraft and automobile industries, silicon-coated paper, paper bases for synthetic veneers etc. This has enabled us either entirely or to at least a considerable degree to dispense with imports of these products.

In terms of production volume, our paper industry is currently the fourth largest in the world, trailing only those countries with more highly developed forest-product industries: the U.S., Japan and Canada.

At the same time, current production levels within the pulp and paper industry cannot satisfy the needs of the national economy.

While the pulp and paper industry overall has not achieved satisfactory levels of growth, newsprint production has grown at a faster rate than that of any other product within the industry.

Despite the development of television, radio and the cinema, the printed word in the press, in books and in our school textbooks still plays the key role in the education of our people. And this will remain the case in the future as well. It is for precisely this reason that the past 15 years have seen annual production of paper for the print media (to include newsprint) increase 1.6-fold with paper production overall rising 1.48-fold. At the present time some 42 per cent of all the paper we make in this country goes for newspapers, magazines and books.

Ever since 1982 our enterprises engaged in the production of paper for the print media have been operating under an entirely new set of conditions.

The initiative the Solikamsk and Kotlas combines launched with the objective of achieving greater economies in the consumption of wood and other material resources, an initiative endorsed by the CPSU Central Committee, has been taken up by all enterprises within the industry.

It should be pointed out that to reduce the weight of a square meter of paper is an extraordinarily difficult task. It requires a fundamental, thoroughgoing reorientation psychologically, technically and organizationally. We can now declare with confidence that this reorientation has been accomplished. The workers and technical and engineering personnel of the industry believed that it was both possible and necessary to make lighter-weight paper and that the industry was prepared to carry through a technical revolution in the form of introducing a fundamentally new technology. The Kondopozhskiy, Solikamskiy and Balakhninskiy combines are now making paper weighing 47.34-48.32 g and are preparing for the manufacture of 45-gram paper. Printing paper weighing no more than 62.6 g is now being manufactured as compared with the 67.6 g of 1983.

All this has added to a substantial saving for the entire national economy. We have saved more than 4 million m³ of wood during the first four years of the current five-year-plan period. At the same time we have achieved substantial savings in electricity, fuel and other material resources as well.

The initiative launched by the Kotlas and Solikamsk pulp and paper combines must, of course, be backed up by material incentives to insure adoption on a widespread basis. The industry has developed recommendations for a system of bonuses for workers in enterprises turning out the "lighter" paper and cardboard. In accordance with this system, brigades operating paper- and cardboard-making machinery as well as cutting machines will be paid at different rates depending upon the per-square-meter weight of the paper and cardboard they make. For example, if they reduce the weight of their paper within the limits set by the state standard by 1 per cent, the rate will be raised 1.1-fold, by 2 per cent 1.2-fold and 3 per cent and more 1.3-fold.

Employing the Shchekinskiy approach here, we are recommending that in individual cases the maximum bonus a worker can be paid from the wage fund be increased, the increase to be covered from economies achieved, to 60 per cent of the piece rate wage (wage rate) for workers directly involved in the production of lower-density paper and for maintenance personnel who have achieved high levels of labor productivity. It has also been decided to increase bonuses paid to technical and engineering personnel from the material incentives fund to up to 50 per cent of salary for reductions achieved in the per-square-meter weight of paper and cardboard. At the present time 75 per cent of the funds freed up from economies in raw and other materials is going for bonuses for workers in industry enterprises producing paper and cardboard of lower per-square-meter weight.

[Question] Virtually everybody in the country uses the products of your industry's enterprises. It will therefore be of interest to every Soviet citizen to know what the ministry is doing to increase the production and improve the quality of the consumer goods you turn out.

[Answer] Minlesbumprom USSR has been designated the ministry primarily responsible for monitoring the status, development and full satisfaction of consumer demand for the following types of consumer goods: furniture, skis, hockey sticks, matches, drawing boards, garden houses, wall paper, school notebooks and white paper and other products. In addition, industry enterprises manufacture more than 200 items from wood which would also fall into the consumer goods category.

Our enterprises are continually increasing their output of consumer goods. Consumer goods production in 1985 will run to 7.5 billion rubles, or 110 per cent of the figure for 1983, furniture accounting for 6.2 billion rubles of this amount (or 108.7 per cent of 1983 production).

Furniture, as anybody would know, is the product most in demand. The idea now is to make furniture that is not only strong, practical and comfortable, but also capable of satisfying the more discriminating demands for attractive interiors. This is making it necessary for us to keep an eye on the furniture market and to make pieces to suit a variety of tastes, but always to insure that our designs correspond to the best models available. With this in mind, we have opened dozens of company furniture outlets in different regions of the country.

In many of these stores the customer can select his furniture from among models offered by the manufacturing enterprise. Incidentally, we are also opening a number of other company stores, which will sell wallpaper, paper products and other items.

Our furniture manufacturers, however, will still be concentrating primarily on the production of the most essential items. These would include kitchen tables, stools, bookshelves, children's beds, desks, dining tables, children's chairs and stools etc. In 1985 we are going to have to meet consumer demand for these items 100 per cent.

[Question] Mikhail Ivanovich, you will surely not deny that personnel turnover in the industry is still running high. In this connection we would like to know what it is doing to retain its manpower and to create a stable work force.

[Answer] Yes, personnel turnover within the industry is indeed still high, higher in fact than the average for industry as a whole. So, what are we doing about it?

First of all, we are looking at the reasons why our people leave their jobs. Studies conducted by sociologists have shown that industry workers attach even greater importance to good manpower organization than they do to the equipment provided them at their work places. The turnover in brigades working on a single job, for example, is 1.5-2.6-fold lower than that among workers not organized into brigades. It is for this reason that we are focusing first and foremost on the effort to establish the brigade form of organization and the brigade system of work incentives on a more widespread basis.

Most of the workers who have left of their own accord have been among the least skilled in our work force and have worked in the enterprise for less than three years. In an effort to retain these people we are employing an entire arsenal of measures: we are building new housing for workers with small families, improving programs aimed at providing vocational guidance for the young people, upgrading working conditions, personal services and recreational facilities, improving the vocational training available to our younger workers and promoting the most capable among them. And I have already mentioned that the program of expanding and consolidating our logging settlements is creating more fertile ground in which such measures can take root and bear fruit.

I am pleased to be able to point out here that our efforts are in fact beginning to bear fruit. The rate of turnover among our loggers has dropped sharply. To reinforce these positive trends, industry officials are focusing the efforts of enterprise and association managers on programs aimed at systematically improving the work they do with their personnel and supporting and encouraging the valuable experience accumulated here. The Archangel'sk Pulp and Paper Combine, for example, has introduced a manpower stabilization program. It is systematically improving working conditions and the social personal services infrastructure within the combine. It has set up facilities in which personnel can receive health care and relax and unwind psychologically. It is running a good program of medical care for workers and their families and expanding its physical education and health improvement programs. The administration gives constant attention to the personal services and leisure time activities available to its young people. The work collectives continuously monitor how well new workers are adapting to their

situations, and the combine is running an efficient, well-directed program of vocation guidance for the students.

The timber and wood products industry has also introduced a number of other measures aimed at reducing personnel turnover. It has been decided that enterprise workers will receive a one-time award for length of service after their first year of employment. After a period of continuous service of from one to three years skilled workers, managers, engineering and technical personnel and employees will be paid a money award in the amount of 10 per cent of their annual wage (salary), all other personnel 5 per cent. A one-time money award for length of service has been introduced for enterprise workers in all the heavily forested regions of the country as well as in the Mari and Udmurt ASSR's and in Gorkiy, Kalinin, Kurgan, Leningrad, Moscow, Novosibirsk, Omsk, Pskov, Chelyabinsk and Yaroslav oblasts.

[Question] One last question, Mikhail Ivanovich. With what accomplishments in work performance are industry workers going to mark the occasion of the 27th Congress of the CPSU?

[Answer] Party work and production operations in all work collectives in the ministry's enterprises are now aimed at insuring that we can render a worthy salute to the 27th CPSU Congress. We are devoting a great deal of our effort to the development of a balanced, stepped-up plan for the country's timber and wood products industry for the Twelfth Five-Year-Plan period. The most important accomplishment with which we plan to greet the congress is our complete fulfillment of all 1985 plan obligations. Socialist competition and all organizational and political activities within the industry are aimed at achieving this goal.

To give you some idea of the scope of these activities and the degree of intensity to be found in the work collectives in our enterprises, it will be enough to point to one of our key performance indicators: efficiency in the use of the raw wood products. I am thinking of the production of some of our newer materials—the effective substitutes for commercial wood such, for example, as wallboard, plywood, container cardboard and industrial chips. By the end of 1985 we will be producing these materials in quantities equivalent to 84 million m³ of commercial timber, that is, more than half the rough timber logged and delivered last year. The Eleventh Five-Year-Plan period overall will see effective commercial wood substitutes manufactured in volumes equivalent to a total of more than 350 million m³ of round timber. Were this volume actually to be logged it would require the harvesting of timber over an area of 2.7 million hectares.

Mechanizing and automating labor-intensive processes and monotonous operations to the extent possible constitute another general direction in the industry's technical policy. The volume of timber harvested in 1985 mechanically will be more than twice the volume of timber harvested by machine in 1980. Improvement in the organization of labor and the introduction of new machines and equipment in logging operations will free up the equivalent of 1000 workers each year.

The high level of enthusiasm for their work you will find among our personnel and the new energy and efficiency with which they are performing following the publication of decisions of the April (1985) CPSU Central Committee plenum constitute a major contribution to the success of our efforts and will help us in 1985 to achieve above-plan increases in productivity and cuts in production

costs and above and beyond plan targets save some 160 million kWh of electricity, almost 700,000 Gcal in thermal energy, roughly 135,000 tons in standard fuel, 1 million m³ of wood and 1000 tons of paint and varnish.

A session of the CPSU Central Committee discussing problems involved in stepping up the pace of scientific and technological progress presented all branches of industry with major new tasks. With the objective of accomplishing these tasks in view, we have outlined the industry's most important programs in the fields of science and technology and discussed them with the State Committee on Science and Technology and the various industries concerned. We have drawn up the supporting and implementing documentation for an expansion of the system of scientific production associations and for the transfer of a number of scientific research institutes to their jurisdiction. Particular attention has been given to the introduction of the completed products of scientific research into production operations, and steps have been taken to raise the technical level of research and testing facilities.

In view of the need to step up the pace of our advance in science and technology we have intensified our efforts in connection with the development of plans for the retooling of our industry for the Twelfth-Five-Year-Plan period and for the period extending to the year 2000. Among other things, we have developed specific proposals for the creation of high-capacity machines for the logging industry and together with the ministry of the chemical industry are working out the problems involved in organizing production of new equipment for chemical wood processing.

By effectively exploiting advances in science and technology, going over to a scientifically based system of manpower organization, reassessing the qualifications required for the work place, improving efficiency and developing and exploiting innovations and inventions we are anticipating that by the end of 1985 we will have achieved economies of the order of 130 million rubles and freed up some 47,000 workers. This will be the gift our industry will present the 27th Party Congress.

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